

APPLICANT IST Associates, Inc.		DOCKET NUMBER IST ASSOC 1/6		This column for use by receiving Office
RO/US RECEIPT DATE		SUBMISSION DATE		
PCT/US 91/06920		September 24, 1991		

**UNITED STATES RECEIVING OFFICE FEE CALCULATION SHEET<sup>1</sup>**

**FEEs SUBMITTED OR AUTHORIZED:**

**I. TRANSMITTAL FEE<sup>2</sup>** ..... 170 T 170

**II. SEARCH FEE<sup>3</sup>** . . . International Search to be conducted by (Check one)

☒ ISA/US (US PTO) ..... 380 S<sup>1</sup> 380

☐ ISA/EP (Eur. Pat. Off.) .....  S<sup>2</sup>

**III. INTERNATIONAL FEE<sup>4</sup>**

**BASIC FEE<sup>5</sup>**

Indicate the number of SHEETS contained in the international application 101 102

first 30 sheets ..... 559 b<sub>1</sub> 490

remaining 71 sheets X \$ 11.00 = 781 b<sub>2</sub> 720

(multiply excess over 30 by amount of supplement to Basic Fee)

Add amounts entered in boxes b<sub>1</sub> and b<sub>2</sub> and enter total in box B.

This figure is the amount of the BASIC FEE ..... 1,340 B 1,340

**DESIGNATION FEES<sup>6</sup>**

Indicate the number of DESIGNATED STATES for which National patents have been sought and multiply by the amount of the designation fee 8 X \$ 135.00 = 1,080 d<sub>1</sub> 952

Indicate the number of GROUPS of designated States for which regional patents have been sought and multiply by the amount of the designation fee 1 X \$ 135.00 = 135 d<sub>2</sub> 119

- Note instructions regarding the application of designation fees below -

Add amounts entered in boxes d<sub>1</sub> and d<sub>2</sub> and enter total in box D.

This figure is the amount of the DESIGNATION FEES ..... 1,215 D 1,215

Add amounts entered in boxes B and D, and enter total in box I.

This figure is the amount of the INTERNATIONAL FEE ..... 2,555 I 2,555

**IV. TOTAL FEES SUBMITTED OR AUTHORIZED:**

Add amounts entered in boxes T, S and I, and enter total in the total box. This figure is the total amount of the FEES SUBMITTED or AUTHORIZED ..... 3,105.00 TOTAL 2,831

Payment must be made in United States currency. Checks, postal money orders or bank drafts must be made payable to the Commissioner of Patents and Trademarks. Payment may also be made by authorization to charge to a Patent and Trademark Office deposit account.

**DEPOSIT ACCOUNT AUTHORIZATION<sup>7</sup>**

- ☐ The RO/US is hereby authorized to charged the total fees indicated above to my deposit account.
- ☒ The RO/US is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.
- ☐ The RO/US is hereby authorized to charge my deposit account for preparation, certification and transmittal of the priority document(s) identified in Box VI of the Request form.

12-1095

Deposit Account Number

Sept. 24, 1991

Date

Signature Marcus J. Millet**INSTRUCTIONS REGARDING DESIGNATION FEES:**

Use the space below to indicate, in order, those countries for which the designation fees submitted or authorized are to be applied. Include after the name of the country any indication that a regional patent is sought. If no countries are indicated below, the RO/US will apply the designation fees submitted or authorized to the designated countries in the order in which those countries are listed in the Request.

## PATENT COOPERATION TREATY

10 JUN 1993

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING  
DOCUMENT TRANSMITTED

To:

United States Patent and Trademark  
Office  
Washington, D.C.

in its capacity as elected Office

Date of mailing:

12 January 1993 (12.01.93)

International application No.:

PCT/US91/06920

International filing date:

24 September 1991 (24.09.91)

Applicant:

IST ASSOCIATES, INC. et al

The International Bureau transmits herewith the following documents and number thereof:

           copy of the international preliminary examination report and annexes (Article 36(3)(a))The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorised officer:

B. Fitzgerald

Telephone No.: (41-22) 730.91.11

## PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

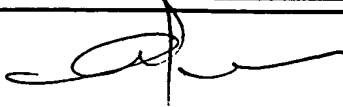
NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

To:

MILLET, Marcus, J.  
Lerner David Littenberg Krumholz &  
Mentlik  
600 South Avenue West  
Westfield, NJ 07090  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year)	21 January 1993 (21.01.93)
Applicant's or agent's file reference	IST ASSOC 1/6
International application No.	PCT/US91/06920
<b>IMPORTANT NOTIFICATION</b> International filing date (day/month/year) 24 September 1991 (24.09.91)	

1. The following indications appeared on record concerning: <input checked="" type="checkbox"/> the applicant <input type="checkbox"/> the inventor <input type="checkbox"/> the agent <input type="checkbox"/> the common representative		
Name and Address  IST ASSOCIATES, INC. 103 Farview Park Drive Elmsford, NY 10523 UNITED STATES OF AMERICA	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning: <input type="checkbox"/> the person <input checked="" type="checkbox"/> the name <input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence		
Name and Address  TESSERA, INC.	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary:		
4. A copy of this notification has been sent to: <input checked="" type="checkbox"/> the receiving Office <input type="checkbox"/> the designated Offices concerned <input type="checkbox"/> the International Searching Authority <input checked="" type="checkbox"/> the elected Offices concerned <input type="checkbox"/> the International Preliminary Examining Authority <input type="checkbox"/> other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. (41-22) 740.14.35	Authorized officer  A. Sinha  Telephone No. (41-22) 730.91.11
--	---

# PATENT COOPERATION TREATY

TO

MARCUS J. MILLET  
LERNER, DAVID, LITTENBERG,  
KRUMHOLZ & MENTLIK  
600 SOUTH AVENUE WEST  
WESTFIELD, NEW JERSEY  
07090

UNITED STATES  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY (IPEA/US)

## WRITTEN OPINION

Issued pursuant to PCT Rules 66.2<sup>(1)</sup> or 66.4(a)<sup>(2)</sup>

DATE OF MAILING by the International Preliminary  
Examining Authority **26 AUG 1992**

APPLICANT'S OR AGENT'S FILE REFERENCE  
**IST ASSOC 3.4-001**

Inscribe NAME and ADDRESS of the AGENT and if there  
is no agent, of the APPLICANT

### IDENTIFICATION OF THE INTERNATIONAL APPLICATION

International Application No.

**PCT/US91/06920**

International Filing Date

**24 SEPTEMBER 1991**

Applicant (Name)

**IST ASSOCIATES, INC.**

Receiving Office

**RO/US**

Priority Date Claimed

**24 SEPTEMBER 1990**

### WRITTEN OPINION

With reference to the above-identified international application, this constitutes  
the FIRST (first, etc.) written opinion by this International Preliminary Examining  
Authority.

#### I. BASIS OF OPINION

The examination is being carried out on the following application documents:

- ☐ the application documents as filed
- ☒ description, pages 1-64, as originally filed
- description, pages     , filed with your letter of     .
- ☒ claim(s) 1-60, as originally filed
- claim(s)     , filed with your letter of     .
- ☒ drawings, sheet/fig.     , as originally filed
- drawings, sheet/fig. 1-19, filed with your letter of 14 NOVEMBER 1991.
- ☐ This opinion has been established as if the amendments indicated on the extra sheet have  
not been made, since, for the reasons indicated, they have been considered to go beyond  
the disclosure as filed.

#### II. NON-ESTABLISHMENT OF OPINION ON NOVELTY, INVENTIVE STEP AND INDUSTRIAL APPLICABILITY

The question whether the claimed invention appears to be novel, to involve an inventive  
step (to be non-obvious), and to be industrially applicable will not for the reasons  
indicated below be gone into in respect of:

1. ☐ the above-identified international application.
2. ☐ claims Nos.      (specify particular claims).
- ☐ Said international application, or said claim Nos.      relate to the following  
subject matter(3) which does not require an international preliminary  
examination. (specify)
- ☐ The description, claims, or drawings (indicate particular elements) or said  
claims Nos.      are so unclear that no meaningful opinion could be formed. (3)
- ☐ The claims, or said claim Nos.      are so inadequately supported by the  
description that no meaningful opinion could be formed. (3)

**LD 111**

**AUG 31 1992**

**RECEIVED**

## WRITTEN OPINION (Continued)

## III. NEGATIVE STATEMENT IN REGARD TO NOVELTY, INVENTIVE STEP AND INDUSTRIAL APPLICABILITY OF CLAIMS

The statement under Article 35(2) should be negative in respect of the claims indicated below. The criteria not satisfied in respect of such claims are indicated by the letter abbreviation: N (for Novelty); IS (for Inventive Step); and IA (for Industrial Applicability).

Claims 1, 15-19 and 50 (IS)

## IV. CITATIONS AND EXPLANATIONS IN REGARD TO NOVELTY, INVENTIVE STEP AND INDUSTRIAL APPLICABILITY OF CLAIMS

## No. of Claim / Relevant Supporting Documents Cited / Explanation

Claims 1 and 15-19 lack an inventive step under PCT Article 33(3) as being obvious over Saito et al.

Saito et al show a semiconductor chip assembly comprising a chip 10 having a plurality of contacts 14 and a sheet like dielectric interposer 16 formed of flexible material having flexible top layer 22 and apertures in the form of vias extending from surface to surface.

A plurality of generally, planar terminals 20 are shown disposed in a pattern overlying a second surface of interposer 16 and associated with one of the contacts on said chip. A conductive lead 18 and in the form of a metallic strip is shown extending between said terminals 20 and contact 14, extending through said aperture or via and formed integrating with said terminal. Said lead is shown to have a contact end connected to contact 14 and a terminal end connected to terminal 20. Said apertures are aligned with the contacts of chip 10, and said leads are shown connected to the contacts on said chip. Figures 1 and 2 shows lead 18 having a curved portion in a direction perpendicular to the second surface of the interposer.

Saito shows consistent or even spacing between terminal and chip contacts in Figures 5 and 6.

As the materials of the interposer and top layer of Saito et al are disclosed to be formed of such low modulus materials as polyimide as well as other thermoplastic polymers. It would have been obvious to one having ordinary skill in the art to form the leads of Saito et al flexible because substrates formed of

**FURTHER INFORMATION CONTINUED FROM PREVIOUS SHEETS**

(Not for publication)

**IV. CITATIONS & EXPLANATIONS IN REGARD TO (N), (IS), AND (IA) OF CLAIMS:**

materials such as polyimide are conventionally formed with flexible leads and as said substrate formed of flexible materials said leads are deemed to also be inherently flexible and therefore moveable.

Claim 50 lacks an inventive step under PCT Article 33(3) as being obvious over Jacobs et al.

Jacobs et al shows in Figure 1 a sheet like backing element 9 formed of flexible materials (i.e., polyimide), at least one rigid support element 8 projecting from said backing element and a plurality of leads a disclosed formed on a surface of element 8 and coupled to electrodes 30 and terminals 29.

It would be obvious to one having ordinary skill in this art that use of such materials as polyimide would render a flexible quality to the backing element.

Claims 2-14, 20-49 and 51-60 meet the criteria set forth in PCT Article 33(2)-(4).

## WRITTEN OPINION (Continued)

## V. CERTAIN DEFECTS IN THE INTERNATIONAL APPLICATION

The following defects in the form or contents of the above-identified international application under the Treaty or the Regulations have been noted.

## VI. CERTAIN OBSERVATIONS ON THE INTERNATIONAL APPLICATION

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are notified:

## VII. INVITATION

APPLICANT IS INVITED TO SUBMIT A WRITTEN REPLY ACCOMPANIED, WHERE APPROPRIATE, BY AMENDMENTS <sup>(4)</sup> WITHIN 2 MONTHS/ ----- DAYS OF THE DATE OF MAILING INDICATED ON THE FIRST SHEET.

Any inquiry concerning this communication should be directed to Sheila Clark at telephone number (703) 308-4924.

The time limit for response to a Written Opinion will not be extended, 37 CFR 1.484(d). Any written response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

## THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Address Only:

Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C.      ATTN: IPEA/US

Authorized Officer

*Jerome Hille*  
ROLF HILLE, PRIMARY EXAMINER      ROZ

# PATENT COOPERATION TREATY

UNITED STATES  
INTERNATIONAL SEARCHING AUTHORITY

MARCUS J. MILLET  
LERNER, DAVID LITTENBERG  
KRUMHOLZ AND MENILIK  
600 SOUTH AVENUE WEST  
WESTFIELD, NEW JERSEY 07090

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT  
OR THE DECLARATION

issued pursuant to PCT Rule 44.1

Inscribe NAME and ADDRESS of the AGENT and if there  
is no agent, of the APPLICANT

DATE OF MAILING by the **23 JAN 1992**  
International Searching Authority

APPLICANT'S OR AGENT'S FILE REFERENCE  
IST ASSOC16

## IDENTIFICATION OF THE INTERNATIONAL APPLICATION

International Application No.

PCT/US91/06920

International Filing Date

24 September 1991

Applicant (Name)

IST ASSOCIATES, INC.,

## NOTIFICATION

The applicant is hereby notified that, in regard to the above-identified international application, this International Searching Authority transmits herewith:

1. ☒ the international search report.

THE ATTENTION OF THE APPLICANT IS DRAWN TO THE TIME LIMIT FOR AMENDING BEFORE THE INTERNATIONAL BUREAU ACCORDING TO ARTICLE 19(1) AND RULE 46.1 WHICH RUNS FROM THE DATE OF MAILING OF THE INTERNATIONAL SEARCH REPORT

2. ☐ the declaration to the effect that no international search report will be established.

THE ATTENTION OF THE APPLICANT IS DRAWN TO THE TIME LIMIT FOR COMPLYING WITH THE REQUIREMENTS OF ARTICLE 22(2).

☐ Applicant is further notified that, the protest against payment of an additional fee under Rule 40.2(c) together with the decision thereon has been transmitted to the International Bureau together with the request to forward the texts of both the protest and the decision thereon to designated Offices.

## THE UNITED STATES INTERNATIONAL SEARCHING AUTHORITY

Address only:

Commissioner of Patents and Trademarks  
Box PCT  
Washington, D. C. 20231

Attn: ISA/US

Authorized Officer

*Sheila V. Clark*  
Sheila V. Clark



# PATENT COOPERATION TREATY

UNITED STATES  
INTERNATIONAL SEARCHING AUTHORITY (ISA/US)

MARCUS J. MILLET  
LERNER DAVID LITTENBERG  
KRUMHOLZ AND MENTLIK  
600 SOUTH AVENUE WEST  
WESTFIELD, NEW JERSEY 07090

## INVITATION TO COMMENT ON ABSTRACT

issued pursuant to PCT Rules 8 and 38.2

Inscribe NAME and ADDRESS of the AGENT and if there is no agent, of the APPLICANT

DATE OF MAILING by the International Searching Authority	22 JAN 1992
APPLICANT'S OR AGENT'S FILE REFERENCE IST ASSOC16	

IDENTIFICATION OF THE INTERNATIONAL APPLICATION	
International Application No.  PCT/US91/06920	International Filing Date  24 September 1991
Applicant (Name)  IST ASSOCIATES, INC.,	

### INVITATION

This International Searching Authority has found that the abstract contained in the above-identified international application does not comply with the requirements relating to the contents and form of the abstract for the reasons indicated below.

The technical features mentioned do not include a reference sign placed between parentheses (PCT Rule 8.1(d)).

Consequently this International Searching Authority has revised the abstract which is attached hereto.

THE APPLICANT IS HEREBY INVITED TO COMMENT ON THIS ABSTRACT WITHIN 1 MONTH FROM THE DATE OF MAILING INDICATED ABOVE.

Computation of the time limit starts on the day following the date of mailing of the present invitation. Within this time limit any comments have to reach this International Searching Authority.

THE UNITED STATES INTERNATIONAL SEARCHING AUTHORITY	
Address only: Commissioner of Patents and Trademarks Box PCT Washington, D. C. 20231	Authorized Officer  Sheila V. Clark

Attn: ISA/US

**PATENT COOPERATION TREATY  
INTERNATIONAL SEARCH REPORT**

<b>IDENTIFICATION OF INTERNATIONAL APPLICATION</b>		Applicant's or Agent's File Reference <b>IST ASSOC16</b>
International Application No. <b>PCT/US91/06920</b>		International Filing Date <b>24 September 1991</b>
Receiving Office <b>RO/US</b>		Priority Date Claimed <b>24 September 1990</b>
Applicant <b>IST ASSOCIATES, INC.,</b>		
I. <input type="checkbox"/> <b>CERTAIN CLAIMS WERE FOUND UNSEARCHABLE</b> (Observations on supplemental sheet (2))		
II. <input type="checkbox"/> <b>UNITY OF INVENTION IS LACKING</b> (Observations on supplemental sheet (2))		
<b>III. TITLE, ABSTRACT AND FIGURE OF DRAWING</b>		
1. The following indicated items are approved as submitted by the applicant: 3 <input checked="" type="checkbox"/> Title. <input type="checkbox"/> Abstract.		
2. The texts established by this International Searching Authority of the following indicated items are set forth below: <input type="checkbox"/> Title. <input type="checkbox"/> Abstract.		
Text of the abstract continued on supplemental sheet 3. a. <input type="checkbox"/> The definitive contents of the abstract are established by this International Searching Authority as proposed in form PCT/ISA/204 previously sent to the applicant. b. <input checked="" type="checkbox"/> This report is incomplete as far as the abstract is concerned as the time limit for comments by the applicant on the draft prepared by this International Searching Authority has not expired. 4. Figure to be published with the abstract Figure No. <u>9</u> <input type="checkbox"/> None of the figures. <input type="checkbox"/> as suggested by the applicant <input type="checkbox"/> because the applicant failed to suggest a figure <input checked="" type="checkbox"/> because this figure better characterizes the invention.		

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US91/069020

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC Int Cl: (5) H01L 23/12, 23/14, 23/48, 23/50 U.S. CL: 357/68, 72, 74, 75, 80; 437/184, 185, 187, 203, 204		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
U.S.	357, 68, 72, 74, 75, 80 437, 184, 185, 187, 203, 204	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>9</sup></b>		
Category <sup>*</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
Y	US, A, 4,878,098 (Saito et al) 31 October 1989, see entire document.	1-6, 15-19, 29-35, 39-49, 20-28, 50-55
Y	US, A, 4,685,998 (Quinn et al) 11 August 1987, see entire document.	1-6, 15-19, 29-25, 39-49
A	US, A, 3,680,206 (Roberts) 01 August 1972, see entire document.	1-6, 15-19, 29-35, 39-49
A	US, A, 3,772,575 (Hegarty et al) 13 November 1973, see entire document.	1-6, 15-19, 29-35, 39-49
A	US, A 4,884,122 (Eichelberger et al) 28 November 1989, see entire document	1-6, 15-19, 29-35, 39-49
A	US, A, 3,868,724 (Perrino) 25 February 1975, see entire document	1-6, 15-19, 29-35
A	US, A, 3,614,832 (Chance et al) 26 October 1971, see entire document	1-6, 15-19, 29-35, 39-49
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><sup>*</sup> Special categories of cited documents: <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search 30 December 1991		Date of Mailing of this International Search Report <b>23 JAN 1992</b>
International Searching Authority ISA/US		Signature of Authorized Officer <i>Sheila V. Clark</i> Sheila V. Clark

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	US,A 4,941,033 (Kishida) 10 July 1990, see entire document.	1-6,15-19,29-35, 39-49
A	US,A, 3,426,252 (Lepselter) 04 February 1969, see entire document.	1-6,15-19,29-35, 39-49
Y,P	US,A,4,967,261 (Niki et al) 30 October 1990, see entire document	20-28,50-55
Y	US,A,4,751,482 (Fukuta et al) 14 June 1988, see entire document	20-28-50-55
Y	US,A 4,811,082 (Jacobs et al) 07 March 1989, see entire document	20-28,50-55
A	US,A,4,926,241 (Carey) 15 May 1990, see entire document.	20-28, 50-55
A	US,A 4,356,374 (Noyori et al) 26 October 1982, see entire document.	7-14,36-38, 56-60

# NOTES TO FORM PCT/ISA/210

These Notes are intended to facilitate the use of the present form. For full information, see the text of the Patent Cooperation Treaty and the texts of the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and the said texts, the latter are applicable. "Article" refers to Articles of the Treaty, "Rule" refers to Rules of the Regulations and "Section" refers to Sections of the Administrative Instructions.

1 This part of the report is filled in only where Article 17(2)(b) applies. (Where certain claims were not searched because of lack of unity of invention and non-payment of additional fees, part VI-rather than this part-is filled in.) Article 17(2) reads as follows:

"(a) If the International Searching Authority considers

- (i) that the international application relates to a subject matter which the International Searching Authority is not required, under the Regulations, to search, and in the particular case decides not to search, or
- (ii) that the description, the claims, or the drawings, fail to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out,

the said Authority shall so declare and shall notify the applicant and the International Bureau that no international search report will be established."

"(b) If any of the situations referred to in subparagraph (a) is found to exist in connection with certain claims only, the international search report shall so indicate in respect of such claims, whereas, for the other claims, the said report shall be established as provided in Article 18."

"No International Searching Authority shall be required to search an international application if, and to the extent to which, its subject matter is any of the following:

- (i) scientific and mathematical theories,
- (ii) plant or animal varieties or essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes,
- (iii) schemes, rules or methods of doing business, performing purely mental acts or playing games,
- (iv) methods for treatment of the human or animal body by surgery or therapy, as well as diagnostic methods,
- (v) mere presentations of information,
- (vi) computers programs to the extent that the International Searching Authority is not equipped to search prior art concerning such programs." (Rule 39)

"(a) Any claim which includes all the features of one or more other claims (claim in dependent form, hereinafter referred to as "dependent claim") shall do so by a reference, if possible at the beginning, to the other claim or claims and shall then state the additional features claimed. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such claims in the alternative only. Multiple dependent claims shall not serve as a basis for any other multiple dependent claim. Where the national law of the national Office acting as International Searching Authority does not allow multiple dependent claims to be drafted in a manner different from that provided for in the preceding two sentences, failure to use that manner of claiming may result in an indication under Article 17(2)(b) in the international search report. Failure to use the said manner of claiming shall have no effect in a designated State if the manner of claiming actually used satisfies the national law of that State." (Rule 6.4(a))

2 This part of the report is filled only where, in the course of the procedure the issuance of this report the International Searching Authority, having found that the international application does not comply with the requirement of unity of invention, invites the applicant to pay additional fees. See Article 17(3)(a) reading as follows:

If the International Searching Authority considers that the international application does not comply with the requirement of unity of invention as set forth in the Regulations, it shall invite the applicant to pay additional fees. The International Searching Authority shall establish the international search report on those parts of the international application which relate to the invention first mentioned in the claims ("main invention") and, provided the required additional fees have been paid within the prescribed time limit, on those parts of the international application which relate to inventions in respect of which the said fees were paid."

"If the applicant paid additional fees for the international search, the international search report shall so indicate. Furthermore, where the international search was made on the main invention only (Article 17(3)(a)), the international search report shall indicate what parts of the international application were and what parts were not searched." (Rule 43.7)

3 "Subject to paragraphs (b) and (c), the international search report shall either state that the International Searching Authority approves the title and the abstract as submitted by the applicant or be accompanied by the

text of the title and/or abstract as established by the International searching Authority under Rules 37 and 38." (Rule 44.2(a))

4 "If, at the time the international search is completed, the time limit allowed for the applicant to comment on any suggestion of the International Searching Authority in respect of the abstract has not expired, the international search report shall indicate that it is incomplete as far as the abstract is concerned." (Rule 44.2(b))

5 The figure(s) suggested by the applicant is indicated in the check list of the request: see Rule 3.3(a)(III).

"(a) If the applicant fails to make the indication referred to in Rule 3.3(a)(iii), or if the International Searching Authority finds that a figure or figures other than that figure or those figures suggested by the applicant would, among all the figures of all the drawings, better characterize the invention, it shall, subject to paragraph (b), indicate the figure or figures which should accompany the abstract when the latter is published by the International Bureau. In such case, the abstract shall be accompanied by the figure or figures so indicated by the International Searching Authority. Otherwise, the abstract shall, subject to paragraph (b), be accompanied by the figure or figures suggested by the applicant.

(b) If the International Searching Authority finds that none of the figures of the drawings is useful for the understanding of the abstract, it shall notify the International Bureau accordingly. In such case, the abstract, when published by the International Bureau, shall not be accompanied by any figure of the drawings even where the applicant has made a suggestion under Rule 3.3(a)(iii)." (Rule 8.2)

6 "The international search report shall contain the classification of the subject matter at least according to the International Patent Classification." (Rule 43.3(a))

"Such classification shall be effected by the International Searching Authority." (Rule 43.3(b))

"Where the subject matter of the international application is such that classification thereof requires more than one classification symbol according to the principles to be followed in the application of the International Patent Classification to any given patent document, the international search report shall indicate all such symbols." (Section 504(a))

"Where any national classification system is used, the international search report may indicate all the applicable classification symbols also according to that system." (Section 504(b))

"Where the subject matter of the international application is classified both according to the International Patent Classification and of any national classification system, the international search report shall, wherever possible, indicate the corresponding symbols of both classifications opposite each other." (Section 504(c))

7 "The international search report shall list the classification identification of the fields searched. If that identification is effected on the basis of a classification other than the International Patent Classification, the International Searching Authority shall publish the classification used." (Rule 43.6(a))

8 "If the international search extended to patents, inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, utility certificates of addition, or published applications for any of those kinds of protection, of States, periods, or languages, not included in the minimum documentation as defined in Rule 34, the international search report shall, when practicable, identify the kinds of documents, the States, the periods, and the languages to which it extended. For the purposes of this paragraph, Article 2(ii) shall not apply." (Rule 43.6(b))

9 "The objective of the international search is to discover relevant prior art" (Article 15(2))

Rule 33.1, entitled "Relevant Prior Art for the International Search," reads as follows:

"(a) For the purposes of Article 15(2), relevant prior art shall consist of everything which has been made available to the public anywhere in the world by means of written disclosure (including drawings and other illustrations) and which is capable of being of assistance in determining that the claimed invention is or is not new and that it does or does not involve an inventive step (i.e. that it is or is not obvious), provided that the making available to the public occurred prior to the international filing date.

"(b) When any written disclosure refers to an oral disclosure, use, exhibition, or other means whereby the contents of the written disclosure were made available to the public, and such making available to the public occurred on a date prior to the international filing date, the international search report shall separately mention that fact and the date on which it occurred if the making available to the public of the written disclosure occurred on a date posterior

- (ii) where the cited document is relevant to two or more claims numbered in consecutive order, the numbers of the first and last claims of the series connected by a hyphen; for example, (1-15) or (2-3);
- (iii) where the cited document is relevant to two or more claims that are not numbered in consecutive order, the number of each claim placed in ascending order and separated by a comma or commas; for example, (1,6) or (1,7,10);

(iv) where the cited document is relevant to more than one series of claims under (ii) above, or to claims of both categories (ii) and (iii) above, the series or individual claim numbers and series placed in ascending order using commas to separate the several series, or to separate the numbers of individual claims and each series of claims; for example, (1-6, 9-10, 12-15) or (1, 3-4, 6, 9-11)." (Section 508)

---

## PATENT COOPERATION TREATY

TO

Millet, Marcus J.  
Lerner David Littenberg Krumholz  
& Mentlik  
600 South Avenue West  
Westfield, New Jersey 07090

UNITED STATES  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY (PEA/US)

## NOTIFICATION OF RECEIPT OF DEMAND

issued pursuant to PCT Rule 61.1(b), first sentence

Inscribe NAME and ADDRESS of the AGENT and if  
there is no agent, of the APPLICANT

DATE OF MAILING by the International Preliminary  
Examining Authority **22 APR 1992**

APPLICANT'S OR AGENT'S FILE REFERENCE

IST ASSOC 1/6

## IDENTIFICATION OF THE INTERNATIONAL APPLICATION

International Application No.

PCT/US91/06920

International Filing Date

24 September 1991

Applicant (Name)

IST Associates, Inc.

## NOTIFICATION

The applicant is hereby notified that this International Preliminary  
Examining Authority considers the following date as the date of  
receipt of the demand for international preliminary examination of  
the above-identified international application:

**03 APR 1992**

(date of receipt)

This date of receipt corresponds with the following indicated date:

1. ☒ the actual date of receipt of the demand.
2. ☐ the date on which the proper corrections to the demand  
were timely received.

## THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

Address Only:

Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

ATTN: PEALS

Authorized Officer

**G. HILL**

PCT INTERNATIONAL SERVICES DIVISION

FORM PCT/PEAL/82 (January 1989)

LDLK &amp; M

APR 30 1992

RECEIVED

# PATENT COOPERATION TREATY DEMAND

UNDER ARTICLE 31 OF THE PATENT COOPERATION TREATY:

THE UNDERSIGNED REQUESTS THAT THE INTERNATIONAL APPLICATION SPECIFIED BELOW  
BE THE SUBJECT OF INTERNATIONAL PRELIMINARY EXAMINATION  
ACCORDING TO THE PATENT COOPERATION TREATY

<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>		Applicant's or Agent's File Reference (indicated by applicant if desired) IST ASSOC 1/6	
International Application No. PCT/US91/06920	International Filing Date 24 Sept. 1991	(Earliest) Priority Date 24 Sept. 1990	
Title of Invention SEMICONDUCTOR CHIP ASSEMBLIES, METHODS OF MAKING SAME AND COMPONENTS FOR SAME			
<b>Box No. II APPLICANT(S).</b> Further applicants are indicated on a continuation sheet <input type="checkbox"/>			
Name and address, including postal code and country: IST ASSOCIATES, INC. 103 Fairview Park Drive Elmsford, New York 10523 United States of America A Corporation of the State of Delaware  State of nationality: United States of America      State of residence: United States of America  Telephone number (including area code):      Telegraphic address:      Teleprinter address:			
Name and address, including postal code and country: --    State of nationality:      State of residence: *			
<b>Box No. III AGENT OR COMMON REPRESENTATIVE (IF ANY); ADDRESS FOR NOTIFICATIONS (IN CERTAIN CASES)</b>			
The following named agent or common representative			
1. <input checked="" type="checkbox"/> has been appointed earlier and represents the applicant also for international preliminary examination			
2. <input type="checkbox"/> is hereby appointed and any earlier appointment of an agent is hereby revoked			
3. <input type="checkbox"/> is hereby appointed, in addition to the agent(s) appointed earlier, for the procedure before the International Preliminary Examining Authority			
Name and address, including postal code and country: MILLET, Marcus J. Lerner David Littenberg Krumholz & Mentlik 600 South Avenue West Westfield, New Jersey 07090 United States of America		If the space below is used instead for an address for notifications, check here <input type="checkbox"/>	
Telephone number (including area code): 908-654-5000		Telegraphic address: LITTPAT WESTFIELD	Teleprinter address:
* If the State of residence is not indicated, it will be assumed that it is the same as the State indicated in the address.			



**Box No. IV DECLARATION CONCERNING AMENDMENTS OF THE CLAIMS**

licant wishes international preliminary examination to start promptly on the basis of the claims

- ☒ as filed (amendments under Article 19 have not been made and will not be made)
- ☐ as amended under Article 19
- ☐ as specified on the attached sheet

**Box No. V ELECTION OF STATES**

The following designated States are hereby elected (please mark the applicable check-boxes):

**Regional Patent**

- ☒ **EP** **European Patent:** AT Austria, BE Belgium, DE Germany (Federal Republic of), DK Denmark, FR France, GB United Kingdom, IT Italy, LU Luxembourg, NL Netherlands, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT (including Chapter II thereof).
- ☐ **OA** **OAPI Patent:** Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Gabon, Mali, Mauritania, Senegal, Togo, and any other State which is a Contracting State of the OAPI and of the PCT (including Chapter II thereof).

**National Patent**

- |   |   |
|---|---|
| <input type="checkbox"/> AT Austria                               | <input checked="" type="checkbox"/> KR Republic of Korea        |
| <input checked="" type="checkbox"/> AU Australia                  | <input type="checkbox"/> LK Sri Lanka                           |
| <input type="checkbox"/> BB Barbados                              | <input type="checkbox"/> LU Luxembourg                          |
| <input type="checkbox"/> BG Bulgaria                              | <input type="checkbox"/> MC Monaco                              |
| <input type="checkbox"/> BR Brasil                                | <input type="checkbox"/> MG Madagascar                          |
| <input checked="" type="checkbox"/> CA Canada                     | <input type="checkbox"/> MW Malawi                              |
| <input type="checkbox"/> DE Germany (Federal Republic of)         | <input type="checkbox"/> NL Netherlands                         |
| <input type="checkbox"/> DK Denmark                               | <input type="checkbox"/> NO Norway                              |
| <input checked="" type="checkbox"/> FI Finland                    | <input type="checkbox"/> RO Romania                             |
| <input type="checkbox"/> GB United Kingdom                        | <input type="checkbox"/> SD Sudan                               |
| <input type="checkbox"/> HU Hungary                               | <input checked="" type="checkbox"/> SE Sweden                   |
| <input checked="" type="checkbox"/> JP Japan                      | <input checked="" type="checkbox"/> SU Soviet Union             |
| <input type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> US United States of America |

Space reserved for electing States which have become party to the PCT (including Chapter II thereof) or bound by Chapter II of the PCT after the issuance of this sheet:

**Box No. VI SIGNATURE**LERNER, DAVID, LITTENBERG,  
KRUMHOLZ & MENTLIKBy:   
Marcus J. Millet

(The following is to be filled in by the International Preliminary Examining Authority)

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of DEMAND due to CORRECTIONS under Rule 60.I(b):

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

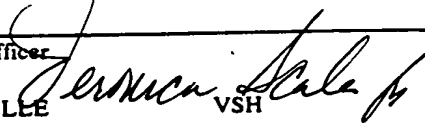
Applicant's or agent's file reference IST ASSOC 1/6	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US91/06920	International filing date (day/month/year) 24 SEPTEMBER 1991	Priority date (day/month/year) 24 SEPTEMBER 1990
International Patent Classification (IPC) or national classification and IPC IPC (5): H01L 23/12, 14, 48, 50 U.S. CL.: 357/68, 72, 74, 75, 80; 437/184, 185, 187, 203, 204		
Applicant IST ASSOCIATES, INC.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 9 sheets.  
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings amended during international preliminary examination and/or containing rectifications made before this Authority.

These annexes consist of a total of     sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  03 APRIL 1992	Date of completion of this report  24 NOVEMBER 1992
Name and mailing address of the IPEA/ Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer  ROLF HILLE VSH
Facsimile No. NOT APPLICABLE	Telephone No. (703) 308-4924

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/06920

## I. Basis of the report

1. This report has been drawn on the basis of:

☐ the international application as originally filed.☒ the description, pages 1-64, as originally filed.pages none, filed with the demand.

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

☒ the claims, pages 65-78, as originally filed.pages none, as amended under Article 19.pages none, filed with the demand.

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

☒ the drawings, sheets/fig (See Attached), as originally filed.

sheets/fig \_\_\_\_\_, filed with the demand.

sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of: pages: none  
sheets of drawings/figures No.: none3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box.

4. Additional observations, if necessary:

## II. Priority

1. ☐ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit requested:☐ copy of the earlier application whose priority has been claimed.☐ translation of the earlier application whose priority has been claimed.2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid.

Thus for the purpose of this report, the international filing date indicated above is considered to be the relevant date.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/US91/06920

## III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The question whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application.

☐ claims Nos.

because:

☐ the said following application, or the said claim Nos. relate to the following subject matter which does not require international preliminary examination (*specify*).

☐ the description, claims or drawings (indicate particular elements below) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*).

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for said claims Nos. .

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/06920

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1 not to invite the applicant to restrict or pay additional fees, for the following reasons:

3. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☐ all parts.
- ☐ the parts relating to claims Nos. .

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/06920

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>1-60</u>	YES
	Claims <u>None</u>	NO
Inventive Step (IS)	Claims <u>2-14, 20-49, 51-60</u>	YES
	Claims <u>1, 15-19, 50</u>	NO
Industrial Applicability (IA)	Claims <u>1-60</u>	YES
	Claims <u>None</u>	NO

**2. CITATIONS AND EXPLANATIONS**

Claims 1 and 15-19 lack an inventive step under PCT Article 33(3) as being obvious over **SAITO ET AL.**

**Saito et al.** shows a semiconductor chip assembly comprising a chip 10 having a plurality of contacts 14 and a sheet-like dielectric interposer 16 formed of flexible material having flexible top layer 22 and apertures in the form of vias extending from surface to surface.

A plurality of generally planar terminals 20 are shown disposed in a pattern overlying a second surface of interposer 16 and associated with one of the contacts on said chip. A conductive lead 18 and in the form of a metallic strip is shown extending between said terminals 20 and contact 14, extending through said aperture or via and formed integrating with said terminal. Said lead is shown to have a contact end connected to contact 14 and a terminal end connected to terminal 20. Said apertures are aligned with the contacts of chip 10, and said leads are shown connected to the contacts on said chip. Figures 1 and 2 shows lead 18 having a curved portion in a direction perpendicular to the second surface of the interposer.

**Saito** shows consistent or even spacing between terminal and chip contacts in Figures 5 and 6.

As the materials of the interposer and top layer of **Saito et al.** are disclosed to be formed of such low modulus materials as polyimide as well as other thermoplastic polymers, it would have been obvious to one having ordinary skill in the art to form the leads of **Saito et al.** flexible because substrates formed of materials such as polyimide are conventionally formed with flexible leads and as said substrate formed of flexible materials said leads are deemed to be also inherently flexible and therefore moveable.

Claim 50 lack an inventive step under PCT Article 33(3) as being obvious over **JACOBS ET AL.**

**Jacobs et al.** shows in Figure 1, a sheet-like backing element 9 formed of flexible materials (i.e. polyimide), at least one rigid support element 8 comprising projecting from said backing element and a plurality of leads a disclosed formed on a surface of element 8 and coupled to electrodes 30 and terminals 29.

(Continued on Supplemental Sheet.)

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/06920

## VI. Certain documents cited

### 1. Certain published documents

Application No.  
Patent No.

Publication Date  
(day/month/year)

Filing Date  
(day/month/year)

Priority date (valid claim)  
(day/month/year)

### 2. Non-written disclosures

Kind of non-written disclosure

Date of non-written disclosure  
(day/month/year)

Date of written disclosure  
referring to non-written disclosure  
(day/month/year)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/06920

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:



INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/06920

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US91/06920

**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box [No.]: I - VIII

Sheet 9

**I. BASIS OF OPINION**

This opinion has been drawn on the basis of the drawings,

    sheets/figures none, as originally filed.

    sheets/fig none, filed with the demand.

and additional amendments:

Sheets 1/19-19/19 filed with the letter dated 14 November 1991.

**V. REASONED STATEMENTS**

**2. Citations and Explanations (Continued):**

It would be obvious to one having ordinary skill in the art that use of such materials as polyimide would render a flexible quality to the backing element.

Claims 2-14, 20-49 and 51-60 meet the criteria set forth in PCT Articles 33(2) (4) because the assembly features recited are not taught nor fairly suggested by the prior art.

# PATENT COOPERATION TREATY

## PCT

From the INTERNATIONAL BUREAU

### NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

To:

MILLET, Marcus, J.  
Lerner David Littenberg Krumholz &  
Mentlik  
600 South Avenue West  
Westfield, NJ 07090  
ETATS-UNIS D'AMERIQUE

Date of mailing  
(day/month/year)

21 January 1993 (21.01.93)

Applicant's or agent's file reference

IST ASSOC 1/6

International application No.

PCT/US91/06920

### IMPORTANT NOTIFICATION

International filing date  
(day/month/year)

24 September 1991 (24.09.91)

1. The following indications appeared on record concerning:



the applicant



the inventor



the agent



the common representative

Name and Address

IST ASSOCIATES, INC.  
103 Farview Park Drive  
Elmsford, NY 10523  
UNITED STATES OF AMERICA

State of Nationality

State of Residence

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:



the person



the name



the address



the nationality



the residence

Name and Address

TESSERA, INC.

State of Nationality

State of Residence

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:



the receiving Office



the designated Offices concerned



the International Searching Authority



the elected Offices concerned



the International Preliminary Examining Authority



other:

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

A. Sinha

Telephone No. (41-22) 730.91.11

**INTERNATIONAL APPLICATION  
UNDER THE  
PATENT COOPERATION TREATY  
REQUEST**

**THE UNDERSIGNED REQUESTS THAT THE PRESENT  
INTERNATIONAL APPLICATION BE PROCESSED  
ACCORDING TO THE PATENT COOPERATION TREATY**

(The following is to be filled in by the receiving Office)

**INTERNATIONAL  
APPLICATION No:**

**INTERNATIONAL  
FILING DATE:**

(Stamp)  
Name of receiving Office and "PCT International Application"

Applicant's or Agent's File Reference  
(indicated by applicant if desired) **IST ASSOC 1/6**

**Box No. I TITLE OF INVENTION**

**SEMICONDUCTOR CHIP ASSEMBLIES, METHODS OF MAKING SAME AND COMPONENTS  
FOR SAME**

**Box No. II APPLICANT (WHETHER OR NOT ALSO INVENTOR); DESIGNATED STATES FOR WHICH HE/SHE/IT IS  
APPLICANT.** Use this box for indicating the applicant or, if there are several applicants, one of them. If more than one person (includes, where  
applicable, a legal entity) is involved, continue in Box No. III.

The person identified in this box is (check one only): ☐ applicant and inventor\* ☒ applicant only

Name and address:\*\*

**IST ASSOCIATES, INC.**

**A Corporation of the State of Delaware**

**103 Fairview Park Drive**

**Elmsford, New York 10523**

**United States of America**

Telephone number:  
(including area code)

Telegraphic address:

Teleprinter address:

Country of nationality: **United States of America** Country of residence:\*\*\***United States of America**

The person identified in this box is *applicant* for the purposes of (check one only):

☒ all designated States ☐ all designated States except  
the United States of America ☐ the United States  
of America only ☐ the States indicated  
in the "Supplemental Box"

**Box No. III FURTHER APPLICANTS, IF ANY; (FURTHER) INVENTORS, IF ANY; DESIGNATED STATES FOR  
WHICH THEY ARE APPLICANTS (IF APPLICABLE).** A separate sub-box has to be filled in in respect of each person (includes, where  
applicable, a legal entity). If the following two sub-boxes are insufficient, continue in the "Supplemental Box," (giving there for each addi-  
tional person the same indications as those requested in the following two sub-boxes) or by using a "continuation sheet."

The person identified in this sub-box is (check one only): ☐ applicant and inventor\* ☐ applicant only ☒ inventor only\*

Name and address:\*\*

**KHANDROS, Igor Y.**

**503 Furnace Dock Road**

**Peekskill, New York 10566**

**United States of America**

If the person identified in this sub-box is *applicant* (or *applicant and inventor*), indicate also:

Country of nationality:

Country of residence:\*\*\*

and whether that person is *applicant* for the purposes of (check one only):

☐ all designated States ☐ all designated States except  
the United States of America ☐ the United States  
of America only ☐ the States indicated  
in the "Supplemental Box"

The person identified in this sub-box is (check one only): ☐ applicant and inventor\* ☐ applicant only ☒ inventor only\*

Name and address:\*\*

**DISTEFANO, Thomas H.**

**29 Birch Brook Road**

**Bronxville, New York 10708**

**United States of America**

If the person identified in this sub-box is *applicant* (or *applicant and inventor*), indicate also:

Country of nationality:

Country of residence:\*\*\*

and whether that person is *applicant* for the purposes of (check one only):

☐ all designated States ☐ all designated States except  
the United States of America ☐ the United States  
of America only ☐ the States indicated  
in the "Supplemental Box"

\* If the person indicated as "applicant and inventor" or as "inventor only" is not an *inventor* for the purposes of all the designated States,  
give the necessary indications in the "Supplemental box."

\*\* Indicate the name of a natural person by giving his/her family name first followed by the given name(s). Indicate the name of a legal entity by  
its full official designation. In the address, include both the postal code (if any) and the country (name).

\*\*\* If residence is not indicated, it will be assumed that the country of residence is the same as the country indicated in the address.

**Box No. IV AGENT (IF ANY) OR COMMON REPRESENTATIVE (IF ANY); ADDRESS FOR NOTIFICATIONS (IN CERTAIN CASES).** A common representative may be appointed only if there are several applicants and if no agent is or has been appointed; the common representative must be one of the applicants.  
The following person (includes, where applicable, a legal entity) is hereby/has been appointed as agent or common representative to act on behalf of the applicant(s) before the competent International Authorities:

Name and address, including postal code and country:

If the space below is used instead for an address for notifications, mark here ☐

MILLET, Marcus J.  
Lerner David Littenberg Krumholz & Mentlik  
600 South Avenue West  
Westfield, New Jersey 07090  
United States of America

Telephone number: 908-654-5000  
(including area code)

Telegraphic address:

LITTPAT  
WESTFIELD

Teleprinter address:

**Box No. V DESIGNATION OF GROUPS OF STATES OR STATES (1); CHOICE OF CERTAIN KINDS OF PROTECTION OR TREATMENT.** The following designations are hereby made (please mark the applicable check-boxes):

**Regional Patent**

☒ **EP European Patent(2):** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, DE Germany (Federal Republic of), DK Denmark, ES Spain, FR France, GB United Kingdom, IT Italy, LU Luxembourg, NL Netherlands, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT

☐ **OA OAPI Patent:** Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Gabon, Mali, Mauritania, Senegal, Togo, and any other State which is a Contracting State of OAPI and of the PCT; if other OAPI title desired, specify on dotted line(3):

**National Patent** (if other kind of protection or treatment desired, specify on dotted line(3))

☐ AT Austria(3) .....  
☒ AU Australia(3) .....  
☐ BB Barbados .....  
☐ BG Bulgaria(3) .....  
☐ BR Brazil(3) .....  
☒ CA Canada .....  
☐ CH and LI Switzerland and Liechtenstein .....  
☐ DE Germany (Federal Republic of)(3) .....  
☐ DK Denmark .....  
☐ ES Spain(3) .....  
☒ FI Finland .....  
☐ GB United Kingdom .....  
☐ HU Hungary .....  
☒ JP Japan(3) .....  
☐ KP Democratic People's Republic of Korea(3) .....

☒ KR Republic of Korea(3) .....  
☐ LK Sri Lanka .....  
☐ LU Luxembourg(3) .....  
☐ MC Monaco(3) .....  
☐ MG Madagascar .....  
☐ MW Malawi(3) .....  
☐ NL Netherlands .....  
☐ NO Norway .....  
☐ RO Romania .....  
☐ SD Sudan .....  
☒ SE Sweden .....  
☒ SU Soviet Union(3) .....  
☒ US United States of America(3) .....

Space reserved for designating States (for the purposes of a national patent) which have become party to the PCT after the issuance of this sheet:

- (1) The applicant's choice of the order of designations may be indicated by marking the check-boxes with sequential arabic numerals (see also the "Notes to Box No. V").
- (2) The selection of particular States for a European patent can be made upon entering the national (regional) phase before the European Patent Office (see also the "Notes to Box No. V").
- (3) If another kind of protection or a title of addition or, in the United States of America, treatment as a continuation or a continuation-in-part is desired, specify according to the instructions given in the "Notes to Box No. V."

**Supplemental Box.** Use this box in the following cases:

- (i) if more than three persons are involved as applicants and/or inventors; in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III;
- (ii) if, in Box No. II or any of the sub-boxes of Box No. III, the indication "the States indicated in the 'Supplemental Box.'" is checked; in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the country or countries (or EP or OA, if applicable) for the purposes of which he/she/it is applicant;
- (iii) if, in Box No. II or any of the sub-boxes of Box No. III, a person indicated as "applicant and inventor" or "inventor only" is not inventor for the purposes of all designated States or for the purposes of the United States of America; in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor and, next to such name, the country or countries (or EP or OA, if applicable) for the purposes of which the named person is inventor;
- (iv) if there is more than one agent and their addresses are not the same; in such case, write "Continuation of Box No. IV" and indicate for each additional agent the same type of information as required in Box No. IV;
- (v) if, in Box No. V, the name of any country (or OAPI) is accompanied by the indication "patent of addition," "certificate of addition," or "inventor's certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "Continuation" or "Continuation-in-part"; in such case, write "Continuation of Box No. V" and the name of each country involved (or OAPI), and after the name of each such country (or OAPI), the number of the parent title or parent application and the date of grant of parent title or filing of parent application;
- (vi) if there are more than three earlier applications whose priority is claimed; in such case, indicate "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;
- (vii) if, in any of the Boxes, the space is insufficient to furnish all the information; in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient;
- (viii) if the applicant intends to claim, in respect of any designated Office, the benefit of provisions of the national law concerning non-prejudicial disclosures or exceptions to lack of novelty; in such case, write "Statement Concerning Non-prejudicial Disclosures or Exceptions to Lack of Novelty" and furnish that statement below.

Continuation of Box IV:

Lerner, Lawrence I.  
 David, Sidney  
 Krumholz, Arnold H.  
 Mentlik, William L.  
 Wepner, Roy H.  
 Nelson, John R.  
 Goldman, Stephen B.  
 Kochanski, Paul H.  
 Millet, Marcus J.  
 Bobis, Daniel H.  
 Kennedy, Charles P.  
 Sales, Bruce H.  
 Gilman, Keith E.  
 Butch, Peter J., III  
 Cohen, Robert B.  
 Dompieri, Arnold B.  
 Teschner, Michael H.  
 Kastner, W. Drew  
 Dickey, Jeffrey S.

If this Supplemental Box is not used, this sheet need not be included in the Request.

**Box No. VI PRIORITY CLAIM (IF ANY).** The priority of the following earlier application(s) is hereby claimed:

Country (country in which it was filed if national application; one of the countries for which it was filed if regional or international application)	Filing Date (day, month, year)	Application No.	Office of Filing (fill in only if the earlier application is an international application or a regional application)
(1) US	(24.09.90) 24 SEPT. 1990	07/586,758	
(2) US	(21.03.91) 21 MARCH 1991	07/673,020	
(3)			

(Letter codes may be used to indicate country and/or Office of filing)

When the earlier application was filed with the Office which, for the purposes of the present international application, is the receiving Office, the applicant may, *against payment of the required fee*, ask the following:

☐ the receiving Office is hereby requested to prepare and transmit to the International Bureau a certified copy of the above-mentioned earlier application/of the earlier applications identified above by the numbers (insert the applicable numbers) .....

**Box No. VII EARLIER SEARCH (IF ANY).** Fill in where a search (international, international-type or other) by the International Searching Authority has already been requested (or completed) and the said Authority is now requested to base the international search, to the extent possible, on the results of the said earlier search. Identify such search or request either by reference to the relevant application (or the translation thereof) or by reference to the search request.

International application number or number and country (or regional Office) of other application:

International/regional/national filing date

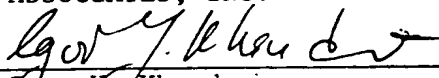
Date of request for search:

Number (if available) given to search request:

**Box No. VIII SIGNATURE OF APPLICANT(S) OR AGENT**

IST ASSOCIATES, INC.

By:

  
George Y. Khandros  
Vice President-Development

If the present Request form is signed on behalf of any applicant by an agent, a separate power of attorney appointing the agent and signed by the applicant is required. If in such case it is desired to make use of a general power of attorney (deposited with the receiving Office), a copy thereof must be attached to this form.

**Box No. IX CHECK LIST (To be filled in by the Applicant)**

This international application contains the following number of sheets:

- |                |            |               |
|----------------|------------|---------------|
| 1. request     | 4          | sheets        |
| 2. description | 64         | sheets        |
| 3. claims      | 14         | sheets        |
| 4. abstract    | 1          | sheets        |
| 5. drawings    | 10         | sheets        |
| <b>Total</b>   | <b>102</b> | <b>sheets</b> |

Figure number .....13..... of the drawings (if any) is suggested to accompany the abstract for publication.

This international application as filed is accompanied by the items checked below:

- ☐ separate signed power of attorney
- ☐ copy of general power of attorney
- ☒ priority document(s) (see Box No. VI)
- ☐ receipt of the fees paid or revenue stamps
- ☒ cheque for the payment of fees
- ☐ request to charge deposit account
- ☒ other document (specify) transmittal letter

(The following is to be filled in by the receiving Office)

- Date of actual receipt of the purported international application:
- Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
- Date of timely receipt of the required corrections under Article 11 of the PCT:
- Drawings ☐ Received ☐ No Drawings

(The following is to be filled in by the International Bureau)

Date of receipt of the record copy:

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

## PCT

### NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

To: MARCUS J. MILLET  
LERNER, DAVID, LITTENBERG, KRUMHOLZ &  
MENTLIK  
600 SOUTH AVENUE WEST  
WESTFIELD, NEW JERSEY 07090

Date of Mailing  
(day/month/year)

**DEC 14 1992**

Applicant's or agent's file reference

IST ASSOC 1/6

#### IMPORTANT NOTIFICATION

International application No.

PCT/US91/06920

International filing date (day/month/year)

24 SEPTEMBER 1991

Priority Date (day/month/year)

24 SEPTEMBER 1990

Applicant

IST ASSOCIATES, INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. NOT APPLICABLE

Authorized officer


ROLF HILLE

Telephone No. (703) 308-4924



# INTERNATIONAL SEARCH REPORT

International Application No. **PCT/US91/01007**

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (In several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC <b>IPC(5): H05K 3/30; B44C 1/22; G01R 1/04; B05D 5/12</b>		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched †		
Classification System	Classification Symbols	
US	29/825,047; 156/643 324/158F, 158P 427/97, 430/312 437/8,187	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ‡		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT *</b>		
Category *	Citation of Document, †† with indication, where appropriate, of the relevant passages ‡‡	Relevant to Claim No. ‡‡
A	US, A, 3,405,361 08 October 1968 (L.E. Kattner et al.)	
Y	US, A, 3,618,201 09 November 1971 (Makimoto et al.)	1-5
A	US, A, 3,702,025 07 November 1972 (Archer)	
A	US, A, 4,038,599 26 July 1977 (Bove & Hubacher)	
A	US, A, 4,636,722 13 January 1987 (Ardezzzone)	
<u>X</u> <u>Y</u>	US, A, 4,649,339 10 March 1987 (Grangroth & Loy)	<u>6</u> <u>7</u>
Y	US, A, 4,820,976 11 April 1989 (Brown)	6-8
A	US, A, 4,853,627 01 August 1989 (Gleason et al.)	
A	US, Y, 4,585,727 29 April 1986 (Reams)	9
A	US, X, 4,868,068 19 September 1989 (Yamaguchi et al.)	37-38
<u>X</u> <u>Y</u>	Solid State Technology, May 1989, Jay Glanville, "Focused Ion Beam Technology for IC Modification" pages 270-272.	<u>39</u> <u>40</u>
* Special categories of cited documents: † "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "A" document member of the same patent family		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
08 JULY 1991	11 JUL 1991	
International Searching Authority	Signature of Authorized Officer	
ISA/US	 CARL J. ARBES	

RE DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
Y	US, A, 4,983,250 08 January 1991 (Pan)	41
X	JP, A, 1-285946 16 November 1989 (Matu)	43
Y	JP, A, 53-76757 07 July 1978 (Kokai)	44
X	US, A, 4,564,584 14 January 1986 (Fredericks et al.)	45
$\frac{X}{Y}$	US, A, 4,088,490 09 May 1978 (Duke et al.)	$\frac{46}{47}$
Y	US, A, 4,115,120 19 September 1978 (dryer et al.)	48-49
A	US, A, 4,936,950 26 June 1990 (Doan et al.)	37-40
A	EP, A, 259,163 09 March 1988 (Rath)	51-54
A	EP, A, 259,162 09 March 1988 (Creedon)	51-54
X	US, A, 4,409,139 11 October 1983 (Colacino et al.)	37-38
Y	US, A, 3,905,818 16 September 1975 (Margrain)	41
Y	US, A, 4,764,485 16 August 1988 (Loughran et al.)	37-38

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 10/08/84. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A- 0112760	04-07-84	FR-A, B 2538166	22-06-84
		JP-A- 59117245	06-07-84
		US-A- 4724473	09-02-88
EP-A- 0004148	19-09-79	US-A- 4147889	03-04-79
		CA-A- 1115820	05-01-82
		JP-A- 54118170	13-09-79
EP-A- 0080041	01-06-83	US-A- 4435740	06-03-84
		DE-A- 3278060	03-03-88
		JP-A- 58080857	16-05-83
FR-A- 2205745	31-05-74	DE-A- 2253627	16-05-74
		GB-A- 1443028	21-07-76
		JP-A- 49077172	25-07-74
		NL-A- 7314802	06-05-74

PCT/US91/06920

ABSTRACT

Semiconductor chip assemblies incorporating flexible, sheet-like elements (42) having terminals thereon overlying the front or rear face of the chip to provide a compact unit. The terminals (48) on the sheet-like element are movable with respect to the chip, so as to compensate for thermal expansion. A resilient element such as a compliant layer (42) interposed between the chip and terminals permits independent movement of the individual terminals toward the chip driving engagement with test probe assembly so as to permit reliable engagement despite tolerances.

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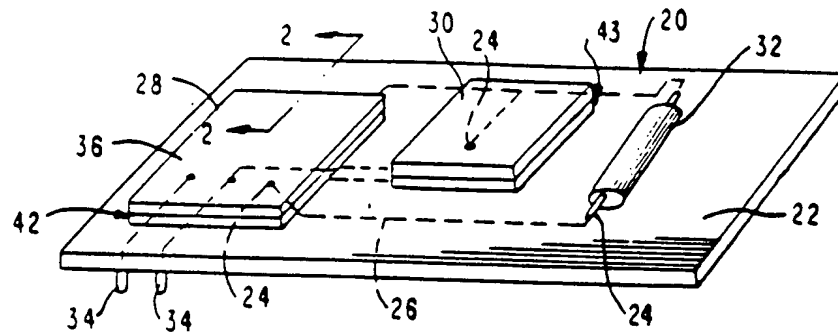


FIG. 1

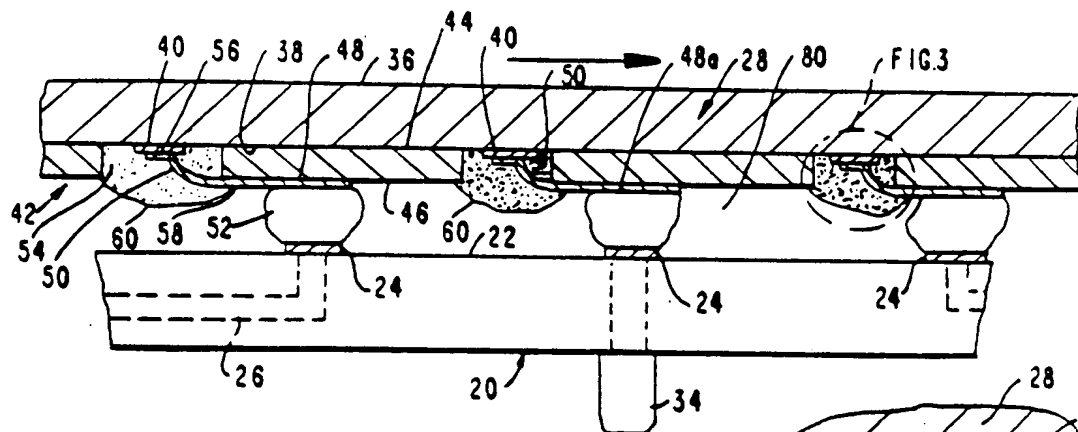


FIG. 2

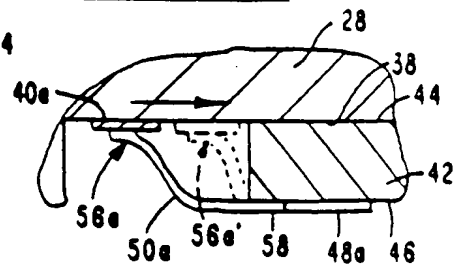


FIG. 3

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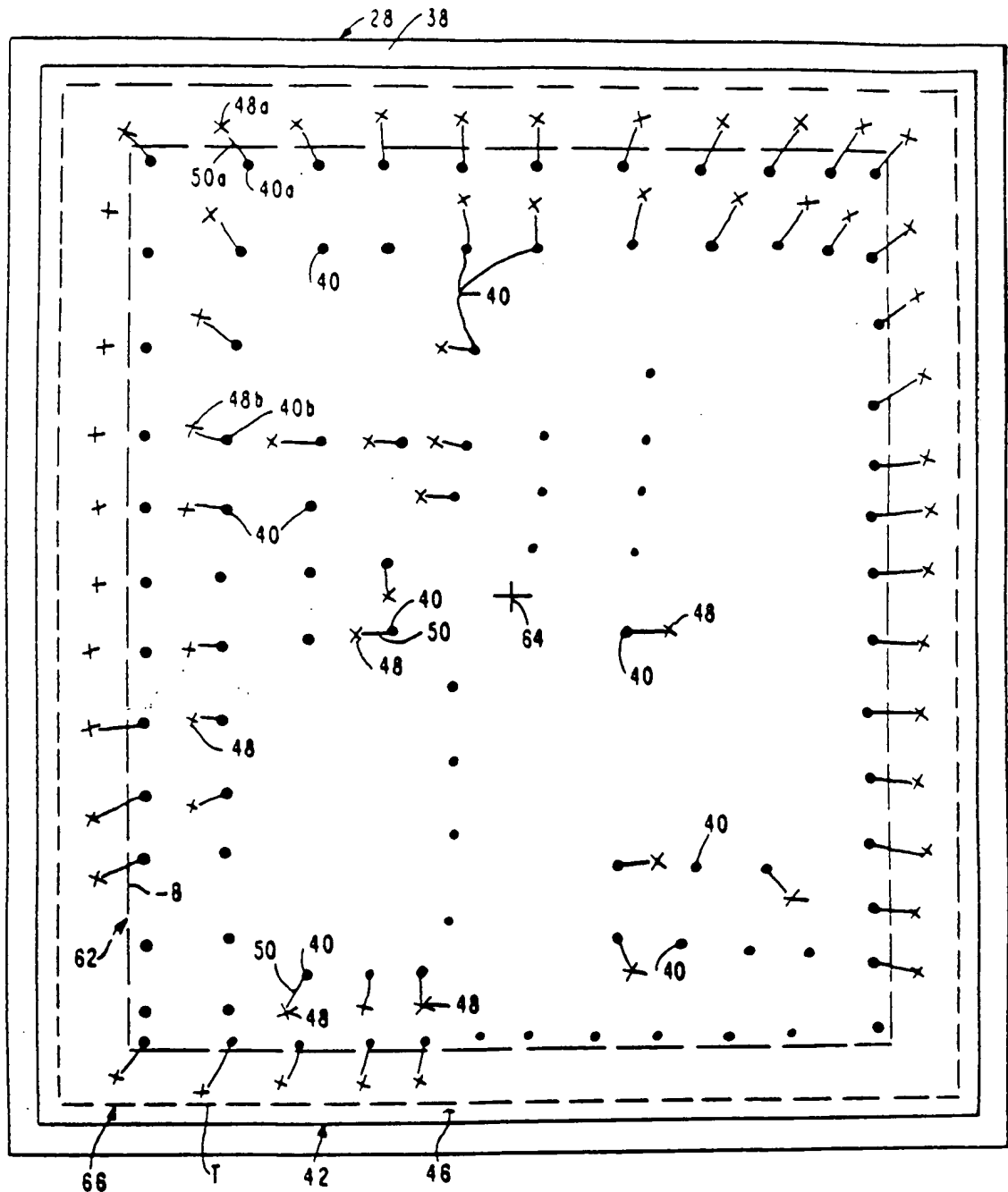


FIG. 4

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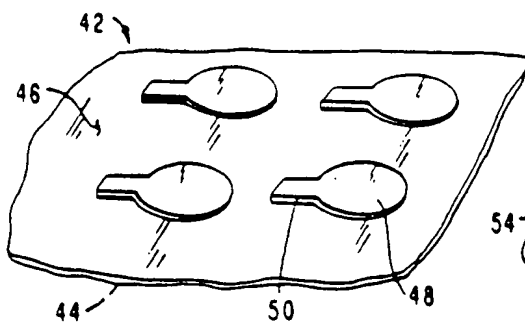


FIG. 5A

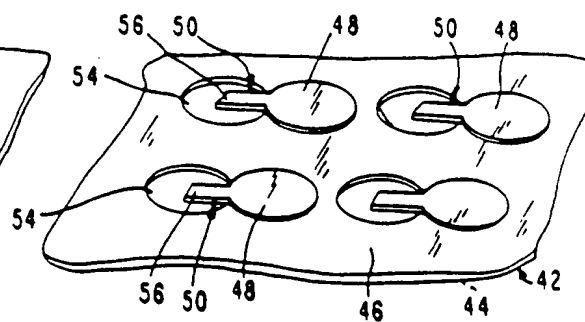


FIG. 5B

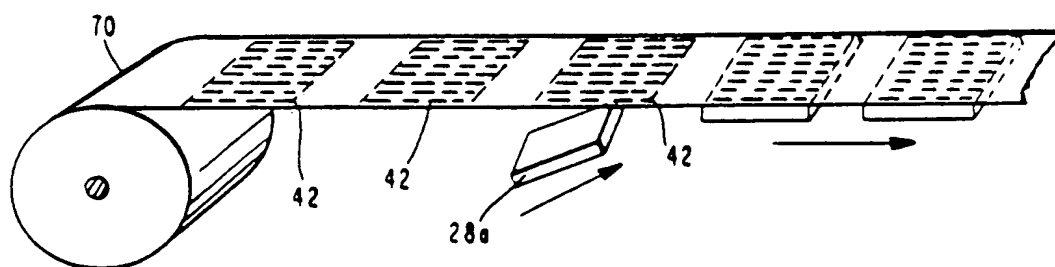


FIG. 6

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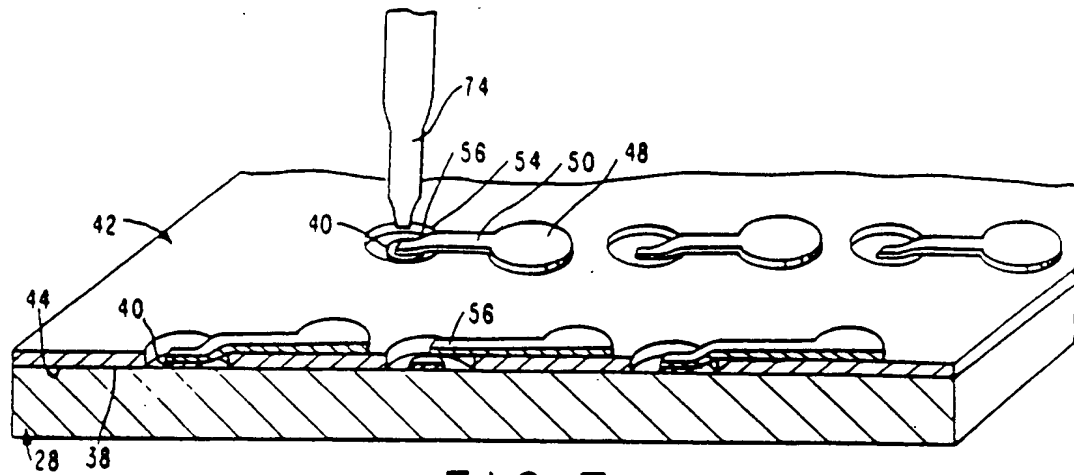


FIG. 7

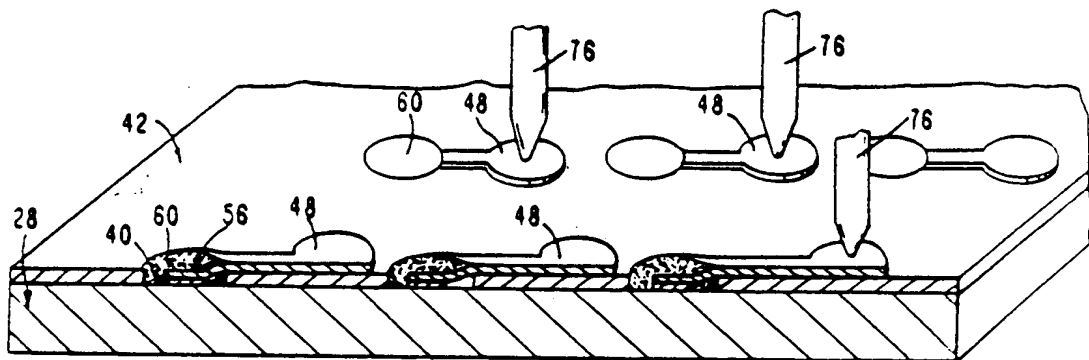


FIG. 8

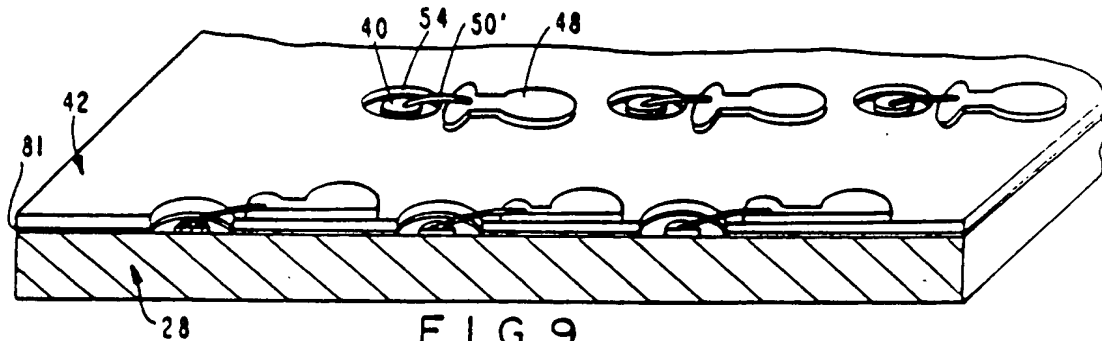


FIG. 9



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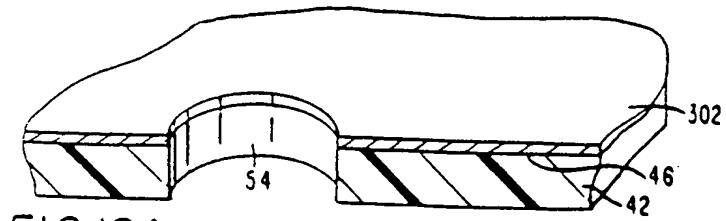


FIG. 10A

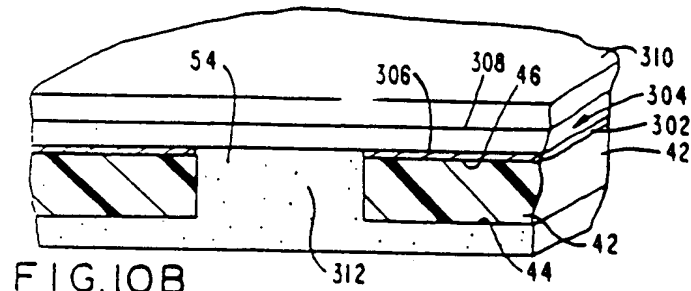


FIG. 10B

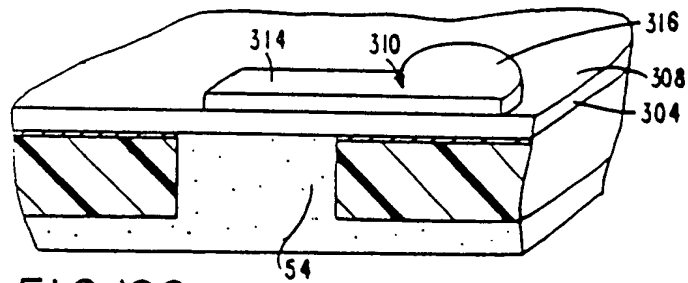


FIG. 10C

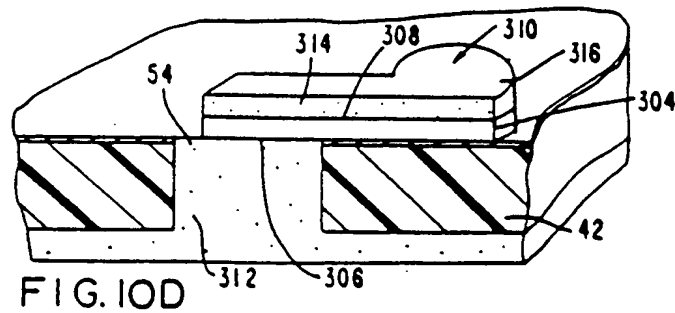


FIG. 10D

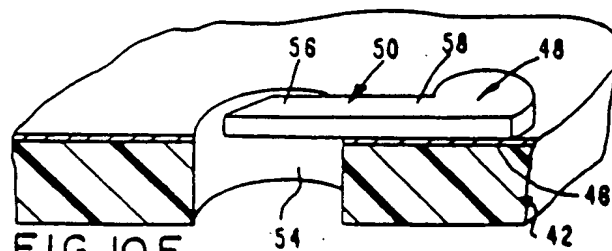


FIG. 10E

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FIG. 11

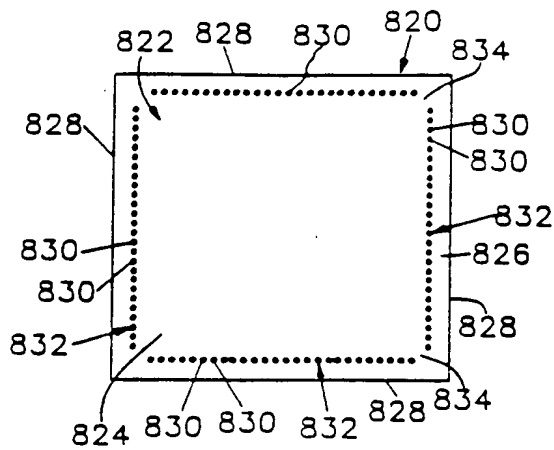


FIG. 12

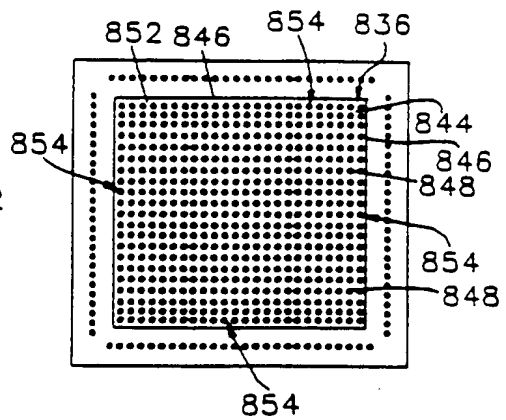


FIG. 17

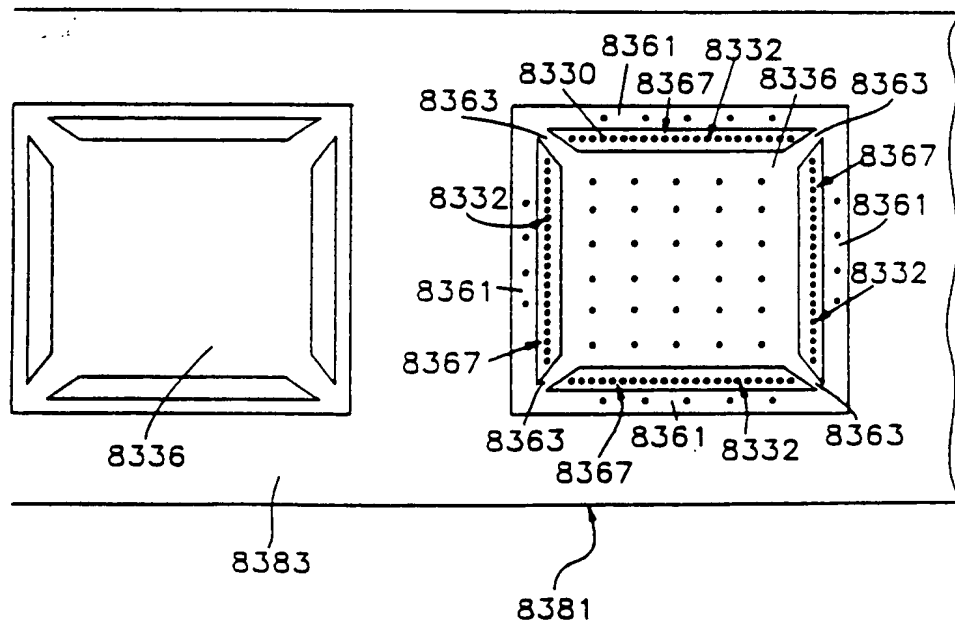
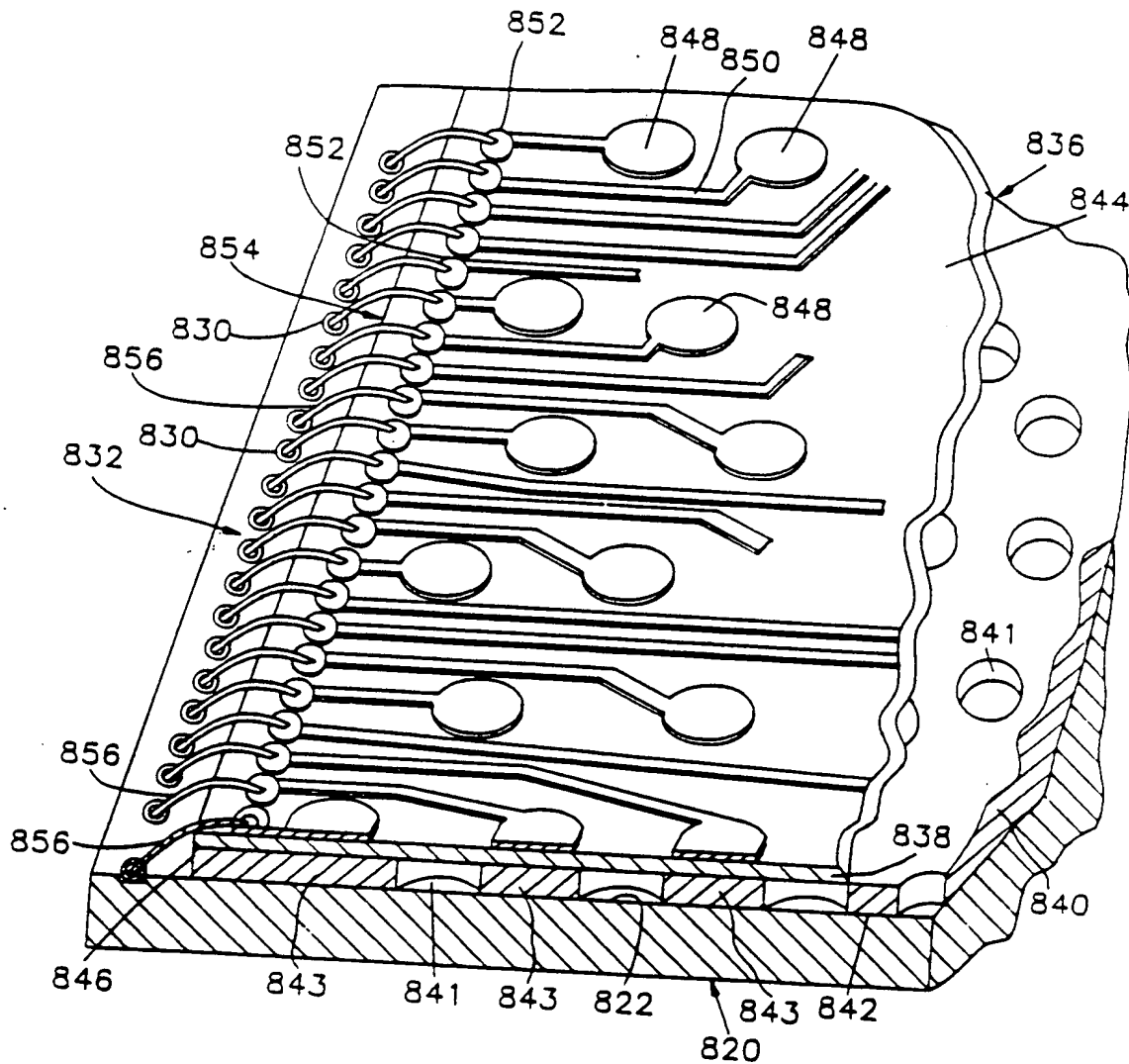
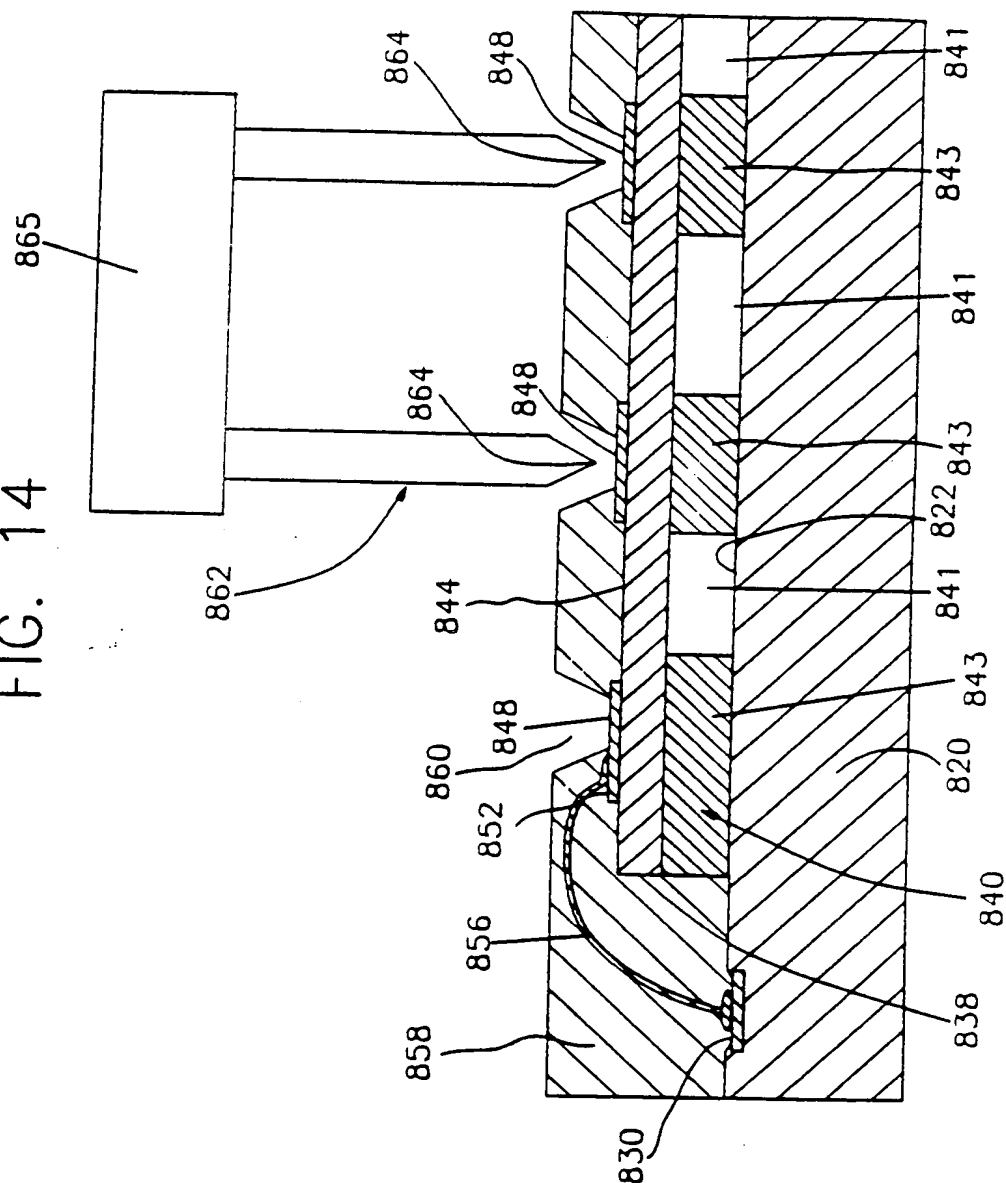


FIG. 13



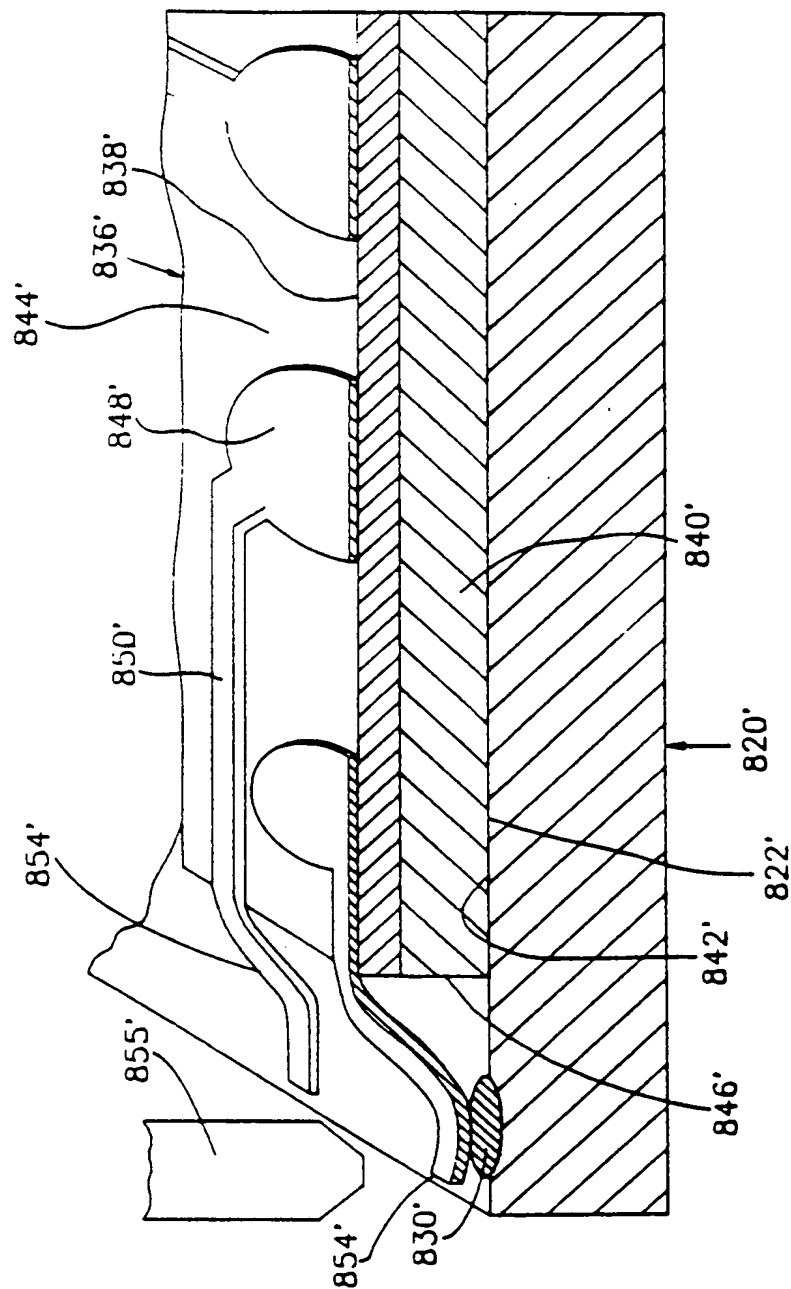
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FIG. 14



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FIG. 15



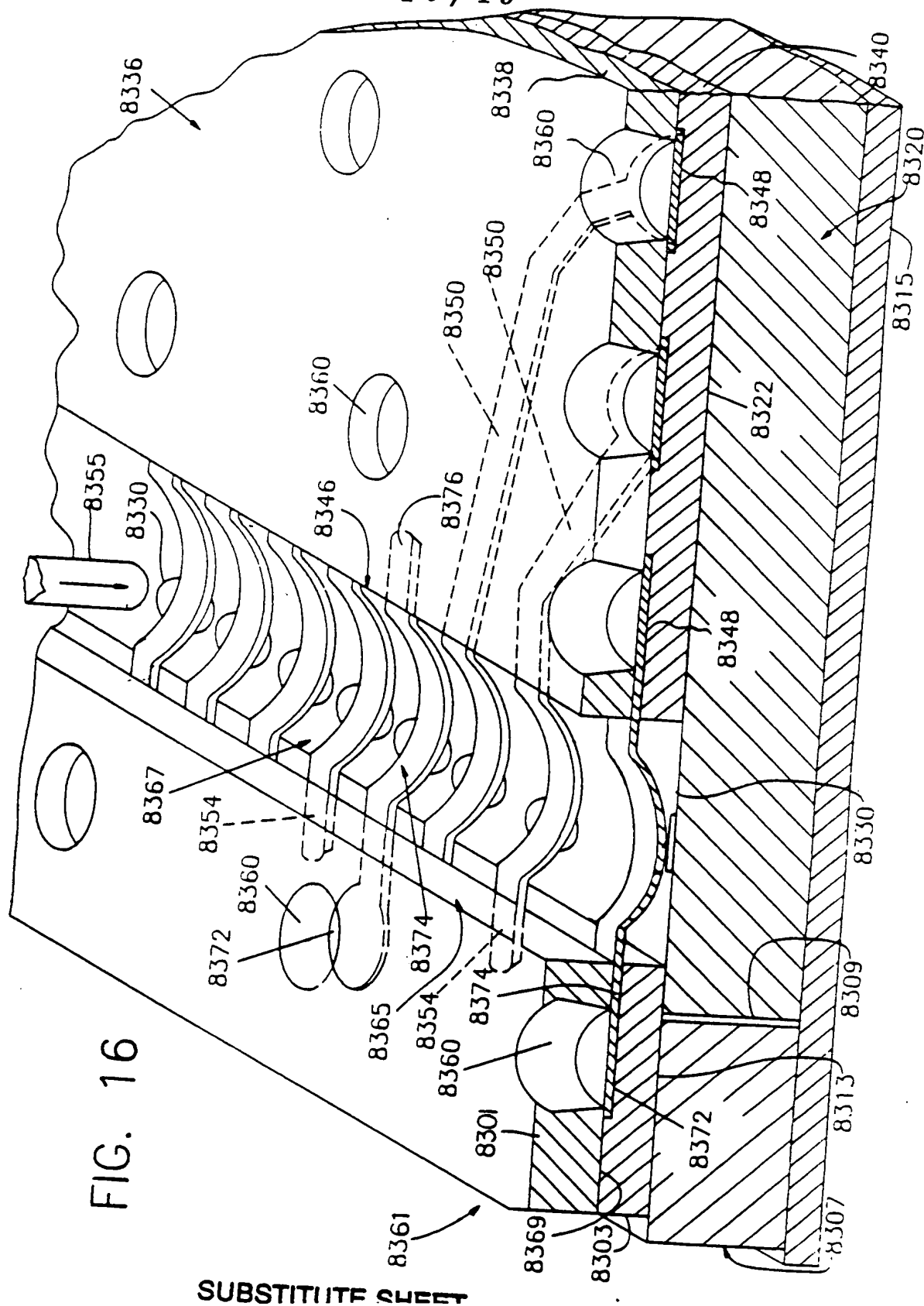
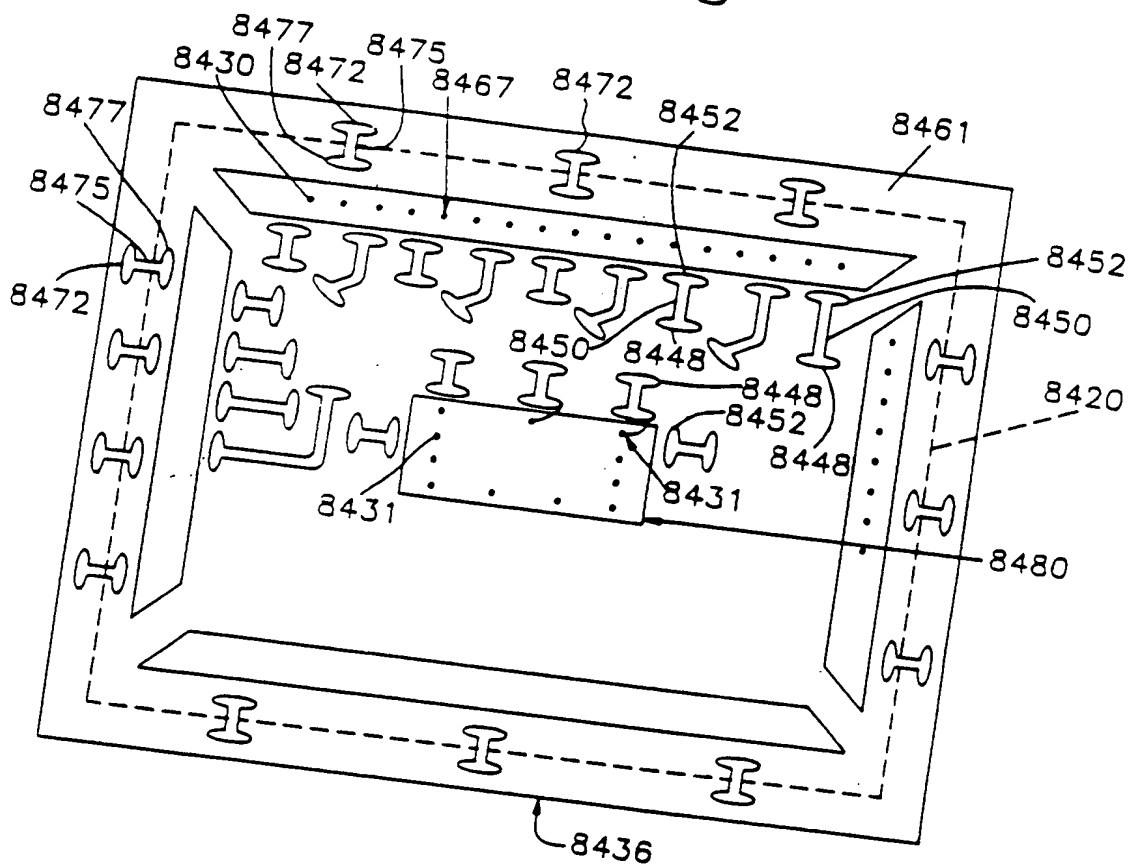
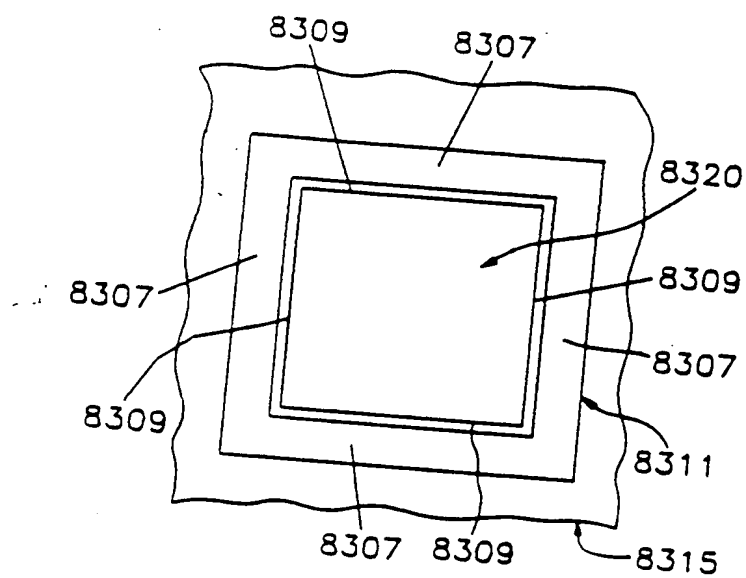


FIG. 18



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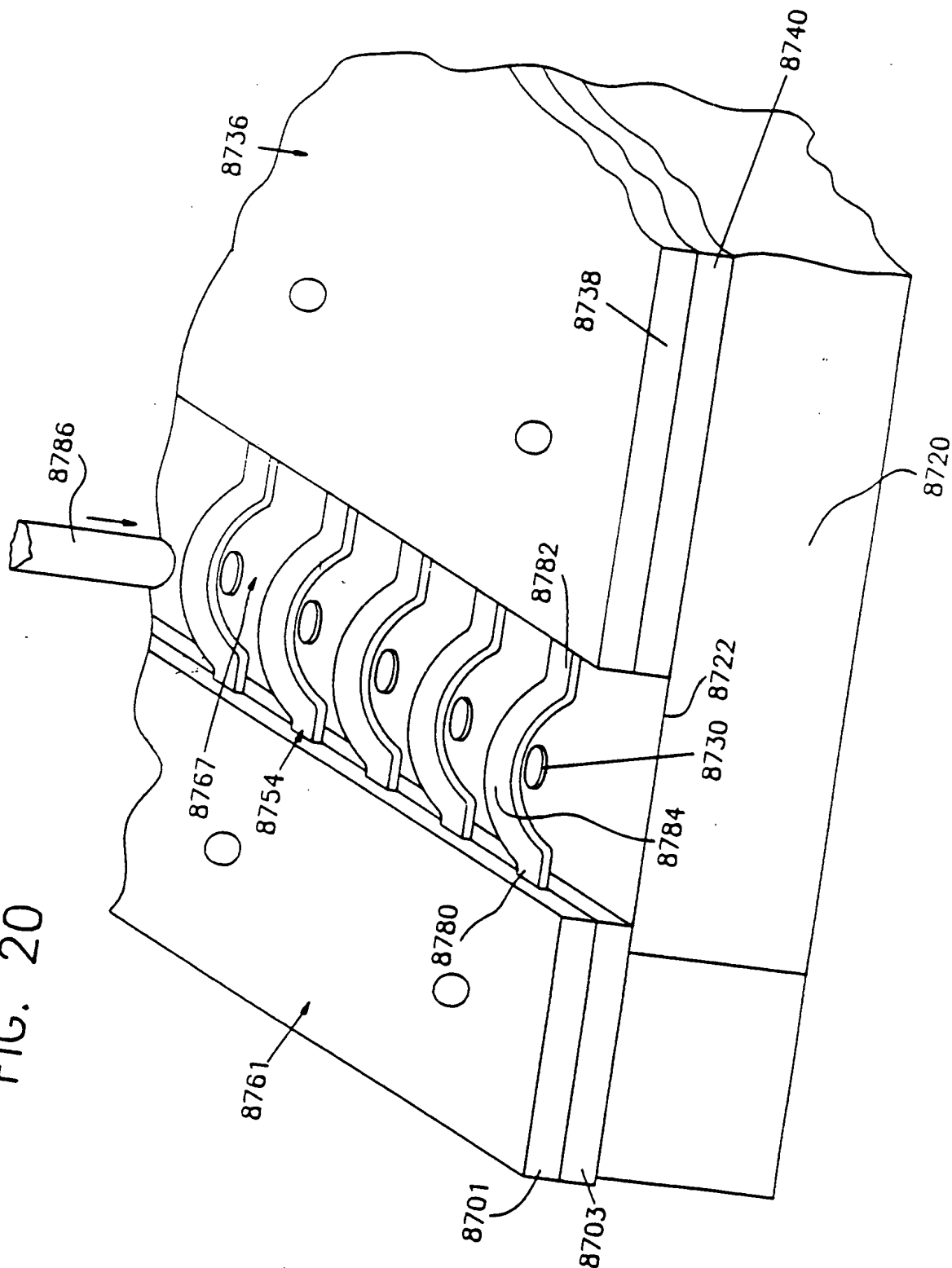
FIG. 19





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FIG. 20



SURSTITUTION

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FIG. 21

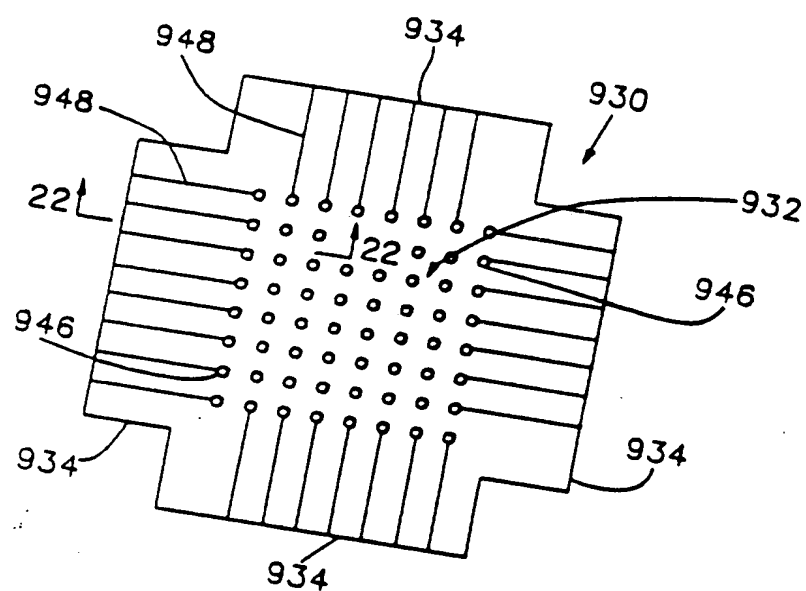


FIG. 22

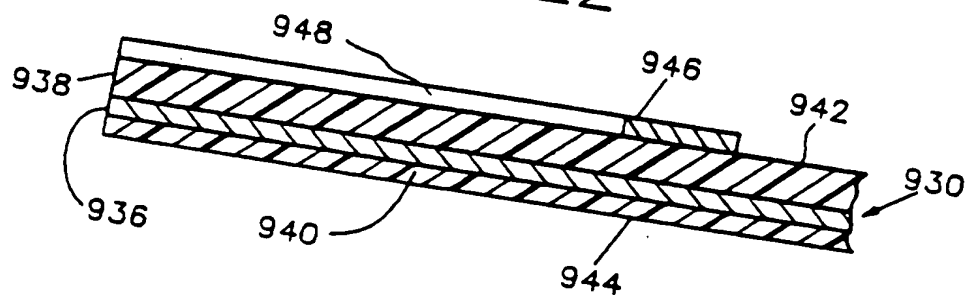


FIG. 23

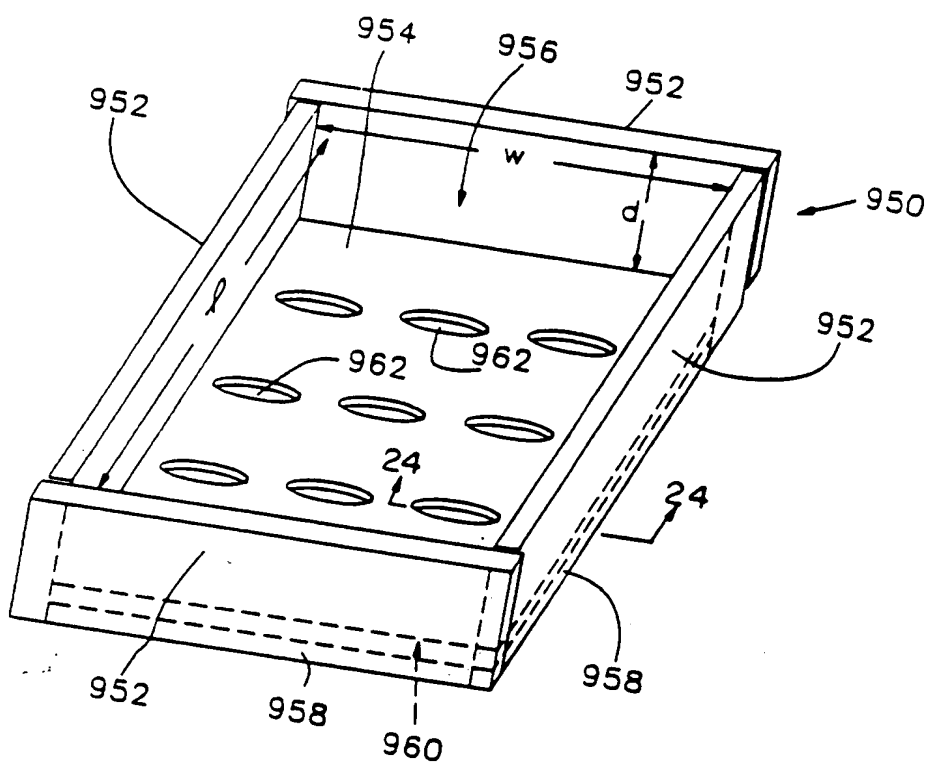
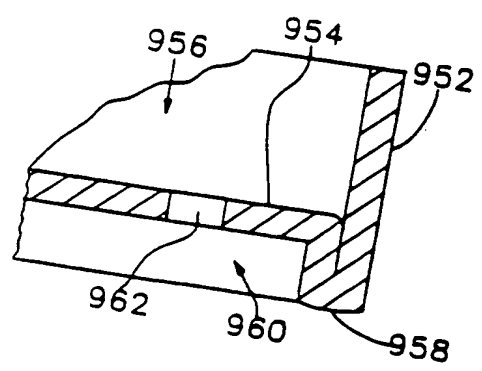
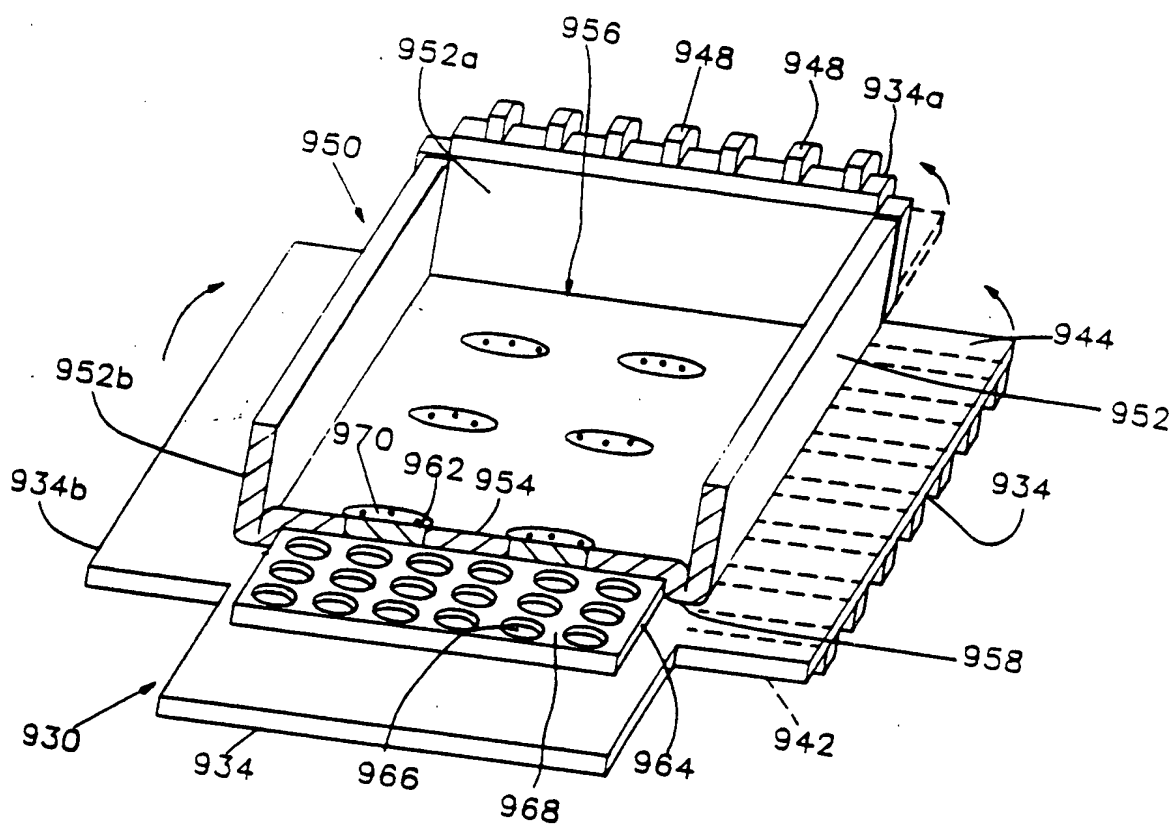


FIG. 24



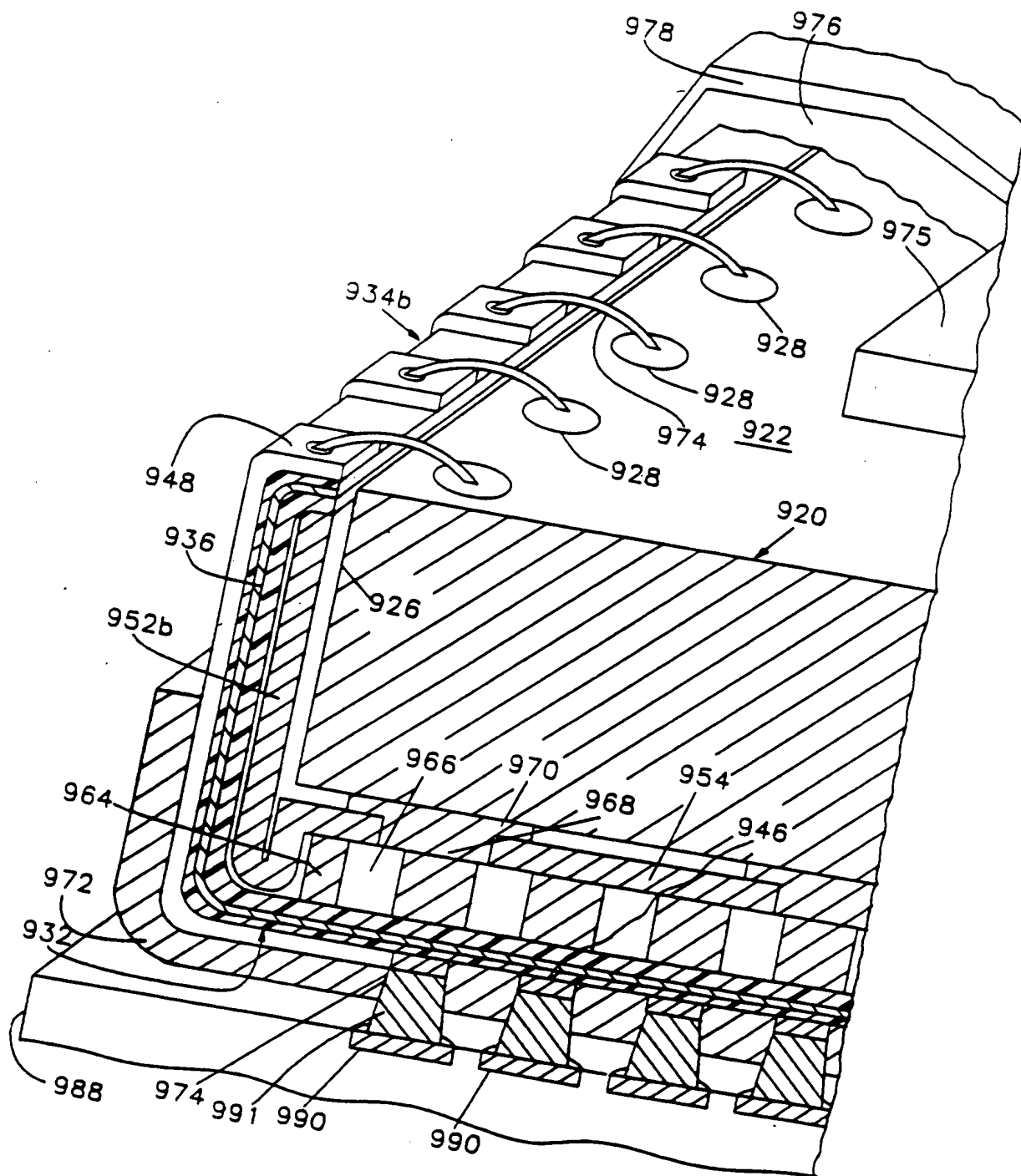
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FIG. 25



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FIG. 26



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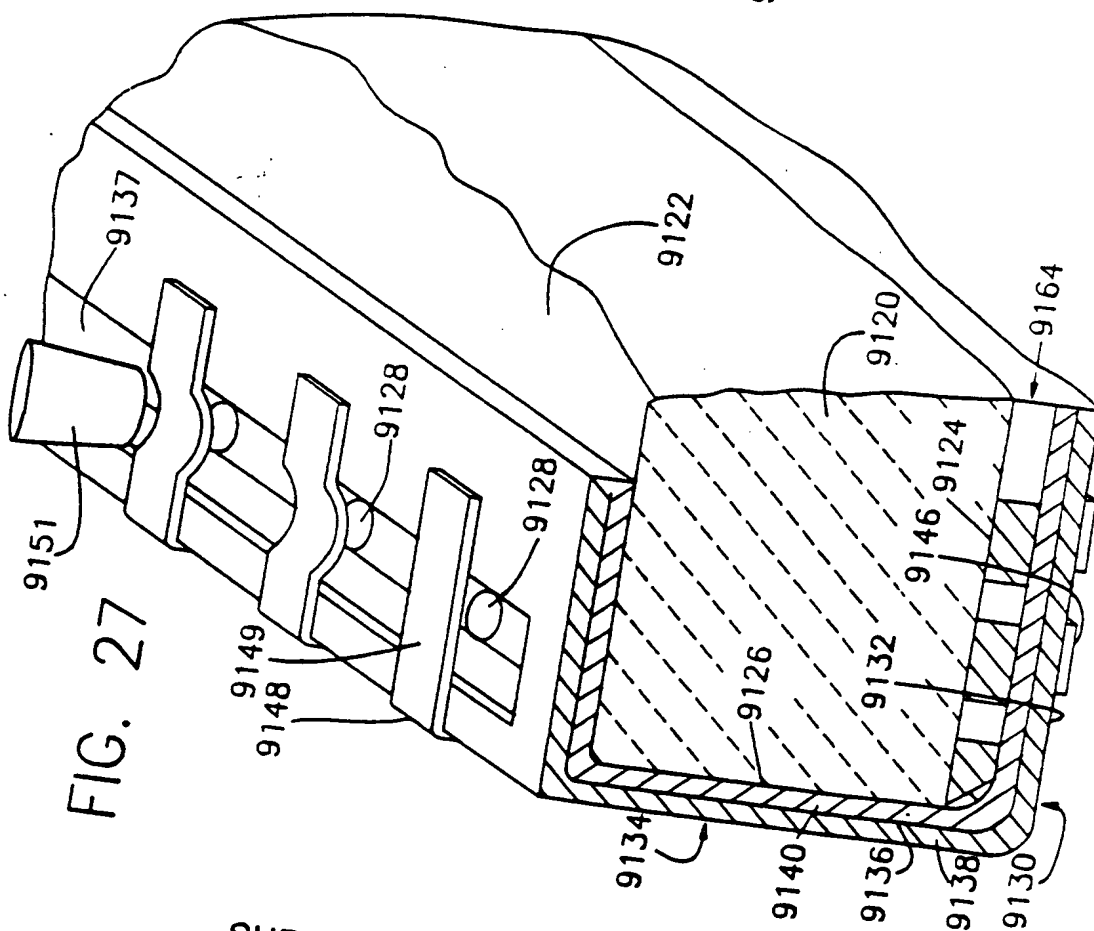
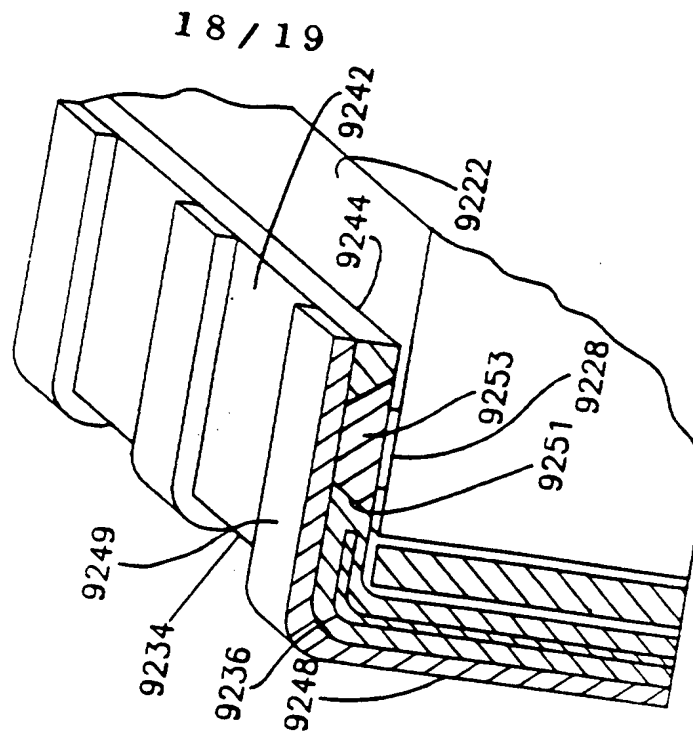


FIG. 28



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FIG. 29

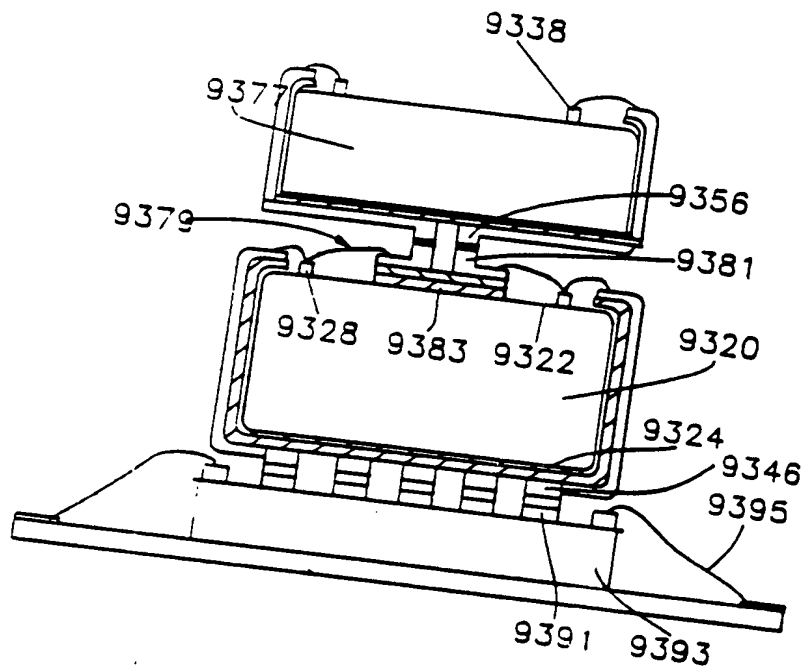
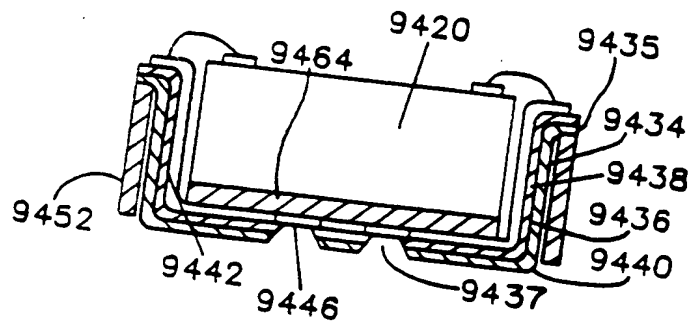


FIG. 30



SUBSTITUTE SHEET